

International Abstract of Surgery

Supplementary to

Surgery, Gynecology and Obstetrics

Volume 65

JULY TO DECEMBER, 1937

PUBLISHED BY

THE SURGICAL PUBLISHING COMPANY OF CHICAGO

54 EAST ERIE STREET, CHICAGO

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INTERNATIONAL ABSTRACT OF SURGERY

JULY, 1937

COLLECTIVE REVIEW

GASTRODUODENAL ULCERATIVE DISEASE

A Review of the Literature for the Years 1934 to 1936, Inclusive

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APPROXIMATELY one thousand new articles on gastroduodenal ulceration appear yearly in the literature. Consideration of each contribution individually may seem to justify the conclusion that the literature on ulcer of each succeeding year resembles that of previous years (Maes 62), but when the articles of the last three years are reviewed as a unit and contrasted with the previous literature, significant advances and new trends become apparent. New nations or groups of nations are contributing evidence of progress which brings them to the foreground. The Scandinavian literature, for example, now holds the dominating position previously occupied by the German; and Russian reports show that the Russians, too, are making rapid progress.

Surgical fundamentals apparently settled twenty years ago are being recalled and rendered familiar to a new surgical generation. The varied types of surgical intervention are being evaluated more accurately by added years of postoperative observation. Cooperation between internists and surgeons is now the rule rather than the exception. Emphasis has been placed on the necessity of drawing surgical indications more sharply, as well as of individualizing each patient for selection of the type of surgical intervention which will promise the best end-results.

The disappointing results in the therapy of gastric carcinoma are now known to be secondary to inadequate diagnostic criteria and not to lack of diagnostic acumen. The introduction of new

forms of medical treatment continues unabated and some of them have achieved striking popularity. The experimental phases of the problem have not been neglected, but little has been achieved in clarifying the *direct* cause of ulcer.

SURGERY

The surgeon may be guided in the treatment of duodenal ulcer by the teachings of two schools holding widely divergent views. On the one side we find a group of surgeons who follow Continental principles and almost routinely favor radical resection of the duodenal ulcer with about three-fifths of the distal stomach. Such a radical procedure is justified because it is followed by the highest percentage of satisfactory end-results and an extremely low incidence of recurrence. A marked reduction in the gastric acidity usually takes place. This is believed due to removal of part of the acid-secreting glands and the acid-secretory stimulant arising in the pyloric glands. The ulcer-bearing area which is called the gastric "motor" and is the seat of an inflammatory process (antroduodenitis) is also eliminated. Finally, the surgical mortality of patients operated upon radically by experienced surgeons is not excessive, being about 5 per cent.

The opposing school of conservative surgeons is, however, still maintaining its position in both the United States and England. It maintains that the more simple and less formidable types of surgical intervention yield satisfactory results without a high incidence of recurrence, and that the desired reduction of gastric acidity is achieved by neutralization or dilution in the duodenum.

An associated antroduodenitis is not a common finding in American or English patients. In addition, the results are associated with a much lower surgical mortality than that of the more radical procedures.

As a result of these divergent positions, the literature on ulcer contains a multitude of irreconcilable reports which tend to support the respective views of their proponents. This is, of course, confusing to the student and the clinician. In addition the selection of appropriate surgical therapy becomes more difficult when we note that some surgeons of international repute do not routinely follow a definite school but individualize the treatment in each case. These independent surgeons vary the nature of their operative procedures not only to comply with both schools, but occasionally to adopt a middle course.

RADICAL SURGICAL OPINION

Perman's monograph (71) on the surgical treatment of gastric and duodenal ulcer may be considered one of the most valuable contributions on the subject in recent years. It is intended to be, not a complete monograph on the surgical treatment of ulcer but rather an account of the author's investigations in the field. It is important because it includes anatomical research, surgical principles, postoperative complications, a review of outstanding contributions and the results obtained by surgical therapy. The material under consideration consisted of 388 cases operated in the period from 1897 to 1925 in Stockholm. This material was evaluated in 1928 and 1929 which makes the observation period for the cases treated in 1925 more than three years. A lifetime of observations and results is summarized.

Beginning with Von Eiselsberg's pyloric exclusion for extrapyloric gastric ulcers, Perman had 5 recurrences in 11 cases. This morbidity caused him to abandon it. In 10 patients followed up after pyloroplasty for duodenal ulcer there were 6 excellent results but no fewer than 10 recurrences. Data were available on 143 patients treated by gastro-enterostomy in the period from 1897 to 1925. Of this group 93 were healthy and had full working capacity, 9 were not completely well but their symptoms were not typical of ulcer. The 9 however were not functionally incapacitated. There were 30 patients with definite ulcer symptoms. The Billroth II type of intervention had a mortality of 11.3 per cent. Of 76 patients included in the statistics, 43 were completely well, 6 had some gastro-intestinal symptoms which did not incapacitate them, 16 were not well and had a decreased working capacity, and 1 had a re-

currence. Of 24 patients re-operated upon for recurrence following gastro-enterostomy or gastro-enterostomy with pyloric exclusion, the anastomoses were undone in 8 with a poor result. Of 3 patients in whom the gastro-enterostomy was undone and a new one superimposed, 1 died and 2 had a recurrence of the ulceration.

This monograph summarizes the experience of approximately thirty years and shows that Perman has gradually adopted the teachings of the more radical school because his patients have shown better end results with a minimum of recurrences when treated by resection. The poor results obtained in patients re-operated upon after gastrojejunostomy may have been instrumental in effecting this change.

The Collective Inquiry of the Fellows of the Association of Surgeons of Great Britain and Ireland into Gastrojejunal Ulceration, by Wright of Manchester (97) has brought forth significant data despite the fact that only 3,803 of a total of 5,964 patients operated upon for peptic ulcer could be traced. The results in the 2,156 remaining patients might have seriously altered the statistics as well as the conclusions with regard to the merits of the varied surgical procedures used.

Of 2,734 patients with duodenal ulcer treated by posterior gastrojejunostomy it was possible to trace 1,730. In 70 (4.04 per cent) gastrojejunal ulcers were proved by operation and in 77 gastrojejunal ulceration was diagnosed from the symptoms. Therefore the total number of proved and suspected cases of gastrojejunal ulcer following posterior gastrojejunostomy amounted to 8.49 per cent. Of a total of 884 patients with gastric ulcer treated by posterior gastrojejunostomy, 507 were traced. In 27 (5.32 per cent) gastrojejunal ulcers were proved by operation and in 26 ulceration was diagnosed from the symptoms, a total of 10.45 per cent. These statistics indicate that in gastric ulcer the incidence of postoperative marginal ulceration is as frequent or even more frequent than in duodenal lesions.

In the introduction to this article, Wright quotes from Patterson's classical paper, *Jejunal and Gastroduodenal Ulceration Following Gastrojejunostomy*, written twenty-five years ago.

The fear of an occurrence of this condition cast a faint shadow over the otherwise admirable result of the operation. Patterson expressed the opinion that the incidence was under 2 per cent and that there were signs that it was diminishing. According to Wright, the fear of postoperative ulcer has increased with the passing years. Increasing recognition of the symptoms and perhaps

a keener and more persistent investigation of unsatisfactory results have resulted in a gradual rise in the estimated risk of postoperative ulcer

In 29 patients who were traced and upon whom an anterior Polya resection was performed for duodenal ulcer, there was no complicating gastrojejunol disease. Of a total of 294 patients treated in a similar fashion for gastric ulcer, 199 were followed up. In 1 (8 per cent) a gastrojejunol ulcer was proved. Of 77 patients with duodenal ulcer upon whom a posterior Polya operation was performed, 2 (2.59 per cent) showed gastrojejunol lesions. It was of interest to note that of a total of 644 patients with gastric carcinoma none of the 436 who were followed up developed secondary ulceration. From this data the author concludes that it is a "fair estimate to say that secondary ulcer occurs in about 6 per cent of the patients following posterior gastrojejunostomy for duodenal ulcer."

The treatment of secondary ulceration by local operations was found extremely unsatisfactory for the most part. The undoing of a gastroenterostomy with restoration of the normal gastro-intestinal continuity was disappointing. It cured 20 per cent of the patients. Establishment of a new gastro-enterostomy was unsatisfactory also, as only 20 per cent of the results were good. Gastrectomy for this type of recurrent marginal ulcer resulted in cure in 60 per cent of the cases. It was associated with a mortality of 20 per cent in the posterior Polya type of resection, and 15.5 per cent in the anterior resection. In the group of patients undergoing resection for a new marginal lesion, the results obtained from posterior anastomosis were more satisfactory than those from anterior anastomosis. The general results of operative treatment in secondary ulceration were found to be discouraging as a rule. Counting operative deaths and deaths resulting from secondary ulceration without surgery, there were 102 fatalities, a mortality of 22.7 per cent. This means that 22.7 per cent of the patients suffering from secondary ulceration are known to have died. *"The complication of secondary ulceration is therefore truly a disastrous one"*

Ogilvie's contribution entitled, "The Place of Surgery in the Treatment of Peptic Ulcer" (70), is unusual for the English literature. Ogilvie is apparently a firm advocate of radical resection, whereas the majority of English surgeons still adhere to the conservative school. He prefers gastro-enterostomy to gastroduodenostomy because the juxtapyloric operations are technically vastly inferior "owing to local difficulties the stoma is clumsy, fixed, and under tension, hem-

orrhage and soiling mar their performance and post-operative leakage is not unknown. Their late results, as might be expected, are on the average inferior to those of the older and simpler anastomoses." His recommendation of gastrectomy is based upon four concepts: (1) gastrectomy removes the ulcer itself when the lesion is in the stomach or in the first part of the duodenum; (2) it overcomes any stenosis which may be present; (3) it allows for neutralization of the gastric secretions by the intestinal juice, and (4) it reduces acid secretion in proportion to the amount of acid-secreting cells that are removed. *At Leeds, in a series of thirty autopsies on patients having had a gastrojejunostomy for duodenal ulcer at periods varying from nine months to nineteen years before death, there were 22 (73 per cent) gastrojejunol ulcers.* Of the last 82 patients with ulcer operated on by Ogilvie, 17 (21 per cent) presented gastrojejunol or gastrojejunocolic ulcers. Ogilvie states, "A patient with a gastrojejunostomy may be happy but he is never safe. I suggest, therefore, that ulceration at or near the stoma will eventually follow gastrojejunostomy in at least 20 per cent of the cases of duodenal ulcer. . . . When this occurs another always difficult operation is eventually required. It may be one of the most difficult in surgery with an average mortality of 19 per cent. If we assume that 5 per cent is a fair average for gastrojejunostomy mortality and if 18 per cent of the survivors develop marginal ulceration which has an operative mortality of 22 per cent, the total death rate following gastroenterostomy will eventually be 9 per cent. Inasmuch as a skilled surgeon will be able to reduce the operative mortality of duodenal ulcer treated by gastrectomy to 5 per cent, the operation of choice which will give the most satisfactory results is therefore physiological gastrectomy."

It is interesting to note that Ogilvie finds that radical resection is ultimately associated with a lower mortality than the conservative interference of gastro-enterostomy. It is of further interest to note that he classifies the type of surgical interference which removes three-fifths of an important organ as "physiological."

"The Surgeon's Responsibility in the Treatment of Duodenal Ulcers," by Graham of Toronto (39), increases the burden already borne by the surgeon. Graham stresses the necessity of differentiating between gastric and duodenal ulcer. "In gastric ulcer there is always the potentiality of a tragedy. In most instances a duodenal ulcer may be so controlled as to be little more than a nuisance." The surgeon must not only understand surgical indications and technique, but he

"must be in a position to assess the efficacy of a non operative regimen, and be in a position to state whether it has been as efficient as possible, because failure to assess this phase of the management of such patients might readily result in the diagnosis of a complicated ulcer when in reality a simple ulcer is present. The surgeon must further realize that the most ideal operative procedure which we have to offer is at best a compromise as far as restoring normal gastric physiological function. Further, he must appreciate that operation never obviates the necessity of the dietetic and hygienic management of such patients, but is simply supplementary."

When the surgeon has assumed the responsibility of advising operation in a case of chronic duodenal ulcer, he must answer two questions. Will the patient survive the procedure? Will the patient remain symptom free and economically efficient? Graham reserves gastro-enterostomy only for patients having a scar stenosis and a low content of free hydrochloric acid or for very elderly patients with a penetrating ulcer and a low content of free hydrochloric acid. If a young patient suffering from a penetrating duodenal ulcer has a patent pylorus and a high content of free hydrochloric acid the operation must be directed at correction of the physiological fault. "If we believe that in the treatment of such a patient a simple gastro-enterostomy has no place. Simple gastro-enterostomy plus a local attack on the ulcer does not decrease the free hydrochloric acid. It may be argued that many such patients are well after a simple gastro-enterostomy, but they are well in spite of the operation and not because of it. Graham has concluded that nothing short of an extensive gastric resection should be carried out upon patients with a penetrating ulcer and patent pylorus and a high content of free hydrochloric acid."

According to Graham's conclusions the surgeon must assume a multiple rôle and be more than the technician performing a surgical procedure. 1 The surgeon is responsible only to patients having a duodenal ulcer which is complicated by penetration obstruction recurrent hemorrhage or perforation. 2 He must assume the responsibility of advising and preparing the patient for the operation. 3 He determines the type of operation by studying the physiological and biochemical possibilities associated with the ulcer, and the late results following the various operative procedures. 4 He must choose an operative procedure which is mechanically sound and results in the absence of free hydrochloric acid in the gastric contents. 5 He should reserve

gastro-enterostomy for patients with scar stenosis and a low content of free hydrochloric acid and for elderly patients with penetrating non stenosing ulcers without obstruction and a low content of free hydrochloric acid. All other patients must accept a radical subtotal gastrectomy. 6 He must realize moreover, that operation is only an adjunct to the management of such patients. 7 He must have a well organized follow up clinic to assist in the rehabilitation of such patients by aiding the mental and physical adjustment to a new routine of life. In other words, the surgeon treating patients for gastroduodenal ulcerative disease must be a physiologist, a biochemist, an internist, a psychologist, a psychiatrist, and a statistician as well as a surgeon in order to obtain the best possible end results.

An important trend is demonstrated by Hinton of New York in his article entitled, Sequela of Peptic Ulcer Following Medical and Surgical Treatment (43). Hinton, a surgeon concerns himself not only with surgical therapy, but with the medical and the physiological phases of the subject. In this article he is concerned with errors in diagnosis and report his studies and classification of cases of gross hemorrhage treated medically and surgically in the Fourth Surgical Division of the Bellevue Hospital.

His dissertation on chronic gastrojejunal ulcer alter both gastro-enterostomy and subtotal resection is significant in that it probably typifies an important trend of opinion. He states, "The incidence after gastro-enterostomy is much higher than is admitted in most clinics provided one is careful to observe these patients over a period of years. On the basis of observation in this clinic, the frequency of 2 or 3 per cent for marginal ulcer after gastro-enterostomy, as reported from most clinics in no way expresses the true incidence of this sequela. According to the observations of my associates and me gastrojejunal ulcer occurred in 10.4 per cent of 85 patients with gastro-enterostomy who have been under observation in this clinic during the past five years. A large number of patients are returning with gastrojejunal lesions as well as with gross hemorrhage as the clinic grows older. Our results from the conservative type of operation have been anything but encouraging."

It is Hinton's opinion (42) that the type of operation to be selected depends upon the individual surgeon and the indications found at the laparotomy. In Hinton's cases the most common condition associated with duodenal ulcer was chronic pancreatitis in the presence of which gastro-enterostomy is most unsatisfactory for the

relief of pain "A subtotal resection is warranted in such cases" Also, bleeding duodenal ulcers are more commonly located in the posterior portion of the duodenum than in the anterior, and for that reason excision of the ulcer is essential for cure. Excision of the ulcer can be done only by subtotal resection. In patients with pyloric obstruction and a large dilated stomach gastro-enterostomy is a quite adequate operation, but even in these marginal ulcer occurs. If then, operation is to be performed upon a patient with duodenal ulcer associated with chronic pancreatitis, a subtotal resection is the operation of choice. The mortality of the resection is no higher in the hands of those who have a reasonable experience in gastric surgery than the general mortality following gastro-enterostomy at the present time.

Hinton, therefore, arrays himself definitely on the side of the radical surgeons and against the surgeons whose trend of opinion has guided America until recent years.

Lahey of Boston (54) has followed the general trend of favoring more radical intervention. From his experiences with over 2,000 patients with ulcer he has concluded that the treatment of ulcer should begin before the ulcer appears, the indigestion and acid stomach should early receive adequate attention. He favors an educational plan for letting patients know how serious peptic ulcer may be and how necessary it is that recurring digestive symptoms be investigated so that treatment can be started in the pre-ulcer stage. Crippling scars and adhesions persist even though the once developed ulcer may be healed eventually. He believes that Hinton's figure of 15 per cent is "probably a fair figure as to the frequency with which jejunal ulcers follow gastro-enterostomy. It is certain in my mind that jejunal ulcer is too frequent, too difficult, and too dangerous a postoperative sequela to gastro-enterostomy to permit the operation to be employed as a routine surgical method of treating particularly duodenal ulcer. There seems little question that the best surgical results, immediate and remote, are in those ulcer patients who post-operatively have a very low gastric acid or gastric anacidity and the operation which undoubtedly most consistently does this is extensive gastrectomy." Lahey's (53) position on this subject appears to be quite clear.

In Germany, where extensive resection has been in vogue for approximately twenty years, there has apparently been no tendency to return to the more conservative types of surgical intervention. Ruge, of the City Hospital of Frankfurt (Schmieden's Clinic) (77), reports that in 1923

gastro-enterostomy was performed in 80 per cent of the cases and resection in 20 per cent, whereas in 1933 gastro-enterostomy constituted 3 per cent and resection 97 per cent of the interventions for gastroduodenal ulcerative disease. Resection affords complete cure in approximately 90 per cent of the cases. Recurrences are practically eliminated although one-tenth of the patients have some postoperative symptoms.

These reports represent only isolated surgeons selected from various metropolitan centers throughout the world. The literature of the last three years contains many similar studies which make a most impressive brief for radical surgery. However, the final solution of the problem of the surgical approach for gastroduodenal ulceration is not so easily reached. Throughout the United States and England there appear reports from conservative surgeons who are well pleased with their end-results, which, in their opinion, approach those of the radical surgeons without the high mortality of the radical intervention.

CONSERVATIVE SURGICAL OPINION

In America the Mayo group headed by Walters (89), Balfour, and Judd is firm in the conviction that "The conservative operations of gastro-enterostomy or gastroduodenostomy performed in some parts of the United States and in some foreign countries, may be followed with results equally as good as those which follow gastric resection compared to patients of other races who, when subjected to conservative operations have given greater evidence of recurring ulceration than might have been expected."

Walters' position is supported by his observations that the patients who come for treatment in Minnesota do not present the associated gastritis nor the extensive pathological changes found in Europe and the eastern United States (90). He says, "A properly performed gastro-enterostomy resulting in a properly functioning gastro-enteric stoma will be followed by healing of whatever inflammatory lesions are present in the duodenum. Gastric resection of many of the large, infiltrating, perforating, duodenal ulcers carries a risk from 5 to 10 times that of gastro-enterostomy. That removal of a hemorrhagic duodenal ulcer is essential is not a proved fact. Studies of the results of various operative procedures for duodenal ulcer have shown that gastro-enterostomy alone will protect the patient against recurrence of hemorrhage in 82 per cent of the cases, and of equal importance is the fact that should hemorrhage recur after gastro-enterostomy, it is seldom of serious import. . . . The case for subtotal gas-

trectomy, with removal of the duodenal ulcer remains one for further study, during which time gastro-enterostomy should continue to hold a position of high regard for it will give good results at low operative risk in properly selected cases in which the response to a properly carried out medical regimen has been inadequate.

Balfour (3) holds practically the same opinion as Walters, but believes that in early cases, when the patient is young the gastric secretion is hyperactive, and motor impairment is usually absent gastro-enterostomy should be avoided because the incidence of jejunal ulceration is high. In his opinion the best procedure is removal of the anterior half of the pyloric muscle with the adjacent portion of the antrum, and resection of the pyloric outlet. Such a procedure is safe, brings about a reasonable reduction of the hyperactivity of the gastric function and in the majority of cases good symptomatic results. Balfour believes that in the long standing cases, in which deep penetrating lesions, obstruction, and gastritis are frequently present gastro-enterostomy deals effectively not only with the primary lesion but also with any existing gastritis. Moreover, the incidence of jejunal ulcer in this group is negligible. Gastrectomy is believed to be associated with a definite percentage of disappointing results both in respect to the relief of symptoms and protection against jejunal ulceration. Chiefly for these reasons Balfour believes that in the treatment of long standing cases of chronic duodenal ulcer gastro-enterostomy holds first place and gastrectomy should be reserved for cases in which the age and type of the individual and the large size and fixation of the ulcer justify the more radical procedure when it can be carried out with safety.

Judd (49) believed that in selected cases of duodenal ulcer gastrojejunostomy continues to be a useful operation. It is particularly satisfactory for older patients and especially for those who have had symptoms of obstruction. "At present among the clientele of most surgeons in this country there seems to be no good reason for radical resection of the stomach in cases of duodenal ulcer.

Maes opinion (62) is characterized by the statement that gastrectomy is rarely if ever warranted in duodenal ulcer. Maes can see no object in subjecting a patient to a risk several times greater than necessary in order to protect him against a possible marginal ulcer when the chance of cure by less drastic measures is 80 per cent or more. He seriously questions whether the incidence of jejunal ulcer is as high as some believe

it to be. Apparently he agrees with Finney who said 'Resection as a punishment for duodenal ulcer is out of all proportion to the crime and adds, It just goes to show how tolerant to punishment the human organism is.'

The Johns Hopkins group may also be classified as adherents of the school of conservative surgeons with regard to gastroduodenal ulcerative disease. Trimble and Reeves (87) report the cases of 150 patients on whom a short loop posterior gastro-enterostomy alone was performed. The operative mortality was 2 per cent. Of 116 patients traced 86 (74.1 per cent) are well, 16 (13.7 per cent) showed improvement in their condition, 1 (8 per cent) showed no improvement, and 13 (12 per cent) are dead. Marginal ulcer occurred in 1 (8 per cent) of 116 patients who were followed up. No comment was made on the 34 patients (29 per cent) who were not followed up.

The Cleveland Clinic may be placed among the constituents of the gastro-enterostomy school. Dinsmore (22) says, Although there has been a universal condemnation of the procedure of gastro-enterostomy I feel it still holds its place as an important surgical procedure in gastric surgery. I am unwilling to agree that a wide resection should be done for every duodenal and gastric ulcer and I believe that in certain instances, a pyloroplasty will give an excellent result."

The preponderance of English opinion on the surgical treatment of duodenal ulceration is summarized by Farquharson (28) in his article entitled 'Problem of the Chronic Duodenal Ulcer without Stenosis'. This presentation is probably representative of the most widely accepted opinion in the British Isles. 'Gastro-enterostomy must be regarded both as the original operation for duodenal ulcer and the one which the majority of surgeons still favour at the present time. Statistics regarding the results of this operation are legion and need not be referred to in detail. All combine to show between 60 and 90 per cent of satisfactory results. In answer to the fact that the statistics of individual surgeons are somewhat misleading because in most cases they present the work of acknowledged experts and not that of the surgical profession as a whole. Farquharson quotes the collective investigation carried out in 1931 by the British Medical Association. In this study 86 surgeons reported their results from gastro-enterostomy. The results were classified as very good in 67.2 per cent of the cases and as good in 23.3 per cent, a total of satisfactory results amounting to approximately 95 per cent. He quotes Ogilvie who said that while the results may be good in 80 per cent of the cases

they varied "from unsatisfactory to dreadful" in the other 20 per cent, and that Hurst has drawn a gloomy picture of the victims of surgery whose lives have been made wretched by the difficulties of jejunal ulcer and gastrojejunal colic fistula. These differences of opinion are explained by the fact that medical failures tend to drift to the surgeon and surgical failures to the physician, with the result that each remains uncertain as to the effects of his treatment and as to his proportion of successes and failures.

Conservatism is supported also by Walton (92) who expresses the opinion that routine gastric resection carries too high a mortality, creates a relatively large risk of anemia, and does not entirely free the patient from the danger of recurrent ulceration. For these reasons Walton prefers "to treat duodenal ulcers by a posterior gastro-enterostomy which has the risk to life of less than 1 per cent, and to reserve partial gastrectomy for the patients—in my own experience between 3 and 4 per cent—who later develop gastrojejunal ulceration." Stenosing ulcers of the duodenum yield most satisfactorily to gastro-enterostomy, which should be the operation of choice. Walton condemns gastroduodenostomy as a measure which has not gained much favor in England and seems to have no advantage over posterior gastro-enterostomy.

To the group of conservative surgeons may be added such authorities as Moynihan (68), Wilkie (95), Rankin (73), and many others, who individually and collectively present an imposing array in favor of conservative intervention for duodenal ulceration. However, it is interesting to note that very slowly a tendency toward more radical surgery is infiltrating both the United States and England, and that a return to a less radical surgical approach is consistently absent in those countries in which gastric resection has been favored and an opportunity for evaluating end-results has been present for many years.

CONSERVATIVE MODIFICATION OF RADICAL SURGERY

A group of radical surgeons has attempted to lower the surgical mortality by adopting a more conservative surgical intervention for that type of ulcer which usually had the highest mortality. Resection is complicated in the type of ulcer which penetrates into the pancreas or the hepatoduodenal ligament, or involves the ampulla of Vater; or when it appears that duodenal closure will be inadequate to prevent the subsequent danger of leakage from the duodenal stump. The operation of "resection for exclusion" was devised

by Finsterer in 1918. It found many advocates and met with vigorous opposition, particularly from von Haberer (40), and Friedemann (36). The criticism of leaving the pylorus with the pyloric glands *in situ* was based upon the belief that a procedure of this type was followed by a high incidence of postoperative ulcer recurrence. Friberg (35) reports his experiences with 68 cases operated in this way. He concluded, "Resection for exclusion is associated not only with a low primary mortality when compared with that of gastro-enterostomy, but also with a permanent cure of 87.7 per cent." These results are equivalent to the end-results obtained from radical resections, and are far better than those obtained from gastro-enterostomy. His percentage of cures was the same whether or not the pylorus was resected. His final conclusion was that the controversy on resection of the pylorus is only of theoretical interest. Practical experience has shown that the pylorus may be left *in situ* without harm. In general his results and opinion have been confirmed by Luebke (59), Hollenbach (44), Eggers (25), and Konjetzny and Kastrup (52).

The ultimate result of this conservatism in the approach to the complicated duodenal ulcer may be the reduction of the primary mortality with still the excellent results claimed for resection. On the Continent, at least, the surgical trend is toward this belief. The confirmation of these results should do much to clarify the selection of operation for the complicated duodenal ulcer, and bridge the existent gap now separating the radical and conservative schools of surgery.

GASTRO-ENTEROSTOMY

Surgeons interested in the conservative approach to this problem will find the "Story of Gastric Surgery" by Maes (62) of interest and the "Evolution and Present Technique of Gastro-jejunostomy" by McNealy and Lichtenstein (65) of practical value. McNealy and Lichtenstein direct our attention to the fundamental work of Moynihan and Mayo done in the first decade of the twentieth century. The selection of the site for the gastro-enterostomy stoma in the stomach and the direction to be taken by the jejunum are described.

The anatomical variations responsible for differences of opinion are once more presented by Trimble and Reeves (87), who say "Jonnescio almost fifty years ago demonstrated that the duodenum may enter the greater peritoneal cavity in one of two ways. In almost 75 per cent of the cases it passes through the root of the mesentery. When it enters the greater peritoneal cavity in

this way it is directed downward and to the left. In about 25 per cent of the cases it runs in the lower leaf of the transverse mesocolon. It is then swung by a mesocolic band downward and to the right. It is best to leave the first portion of the jejunum in its natural position and attached to the stomach in accord with this position. Mayo in 1906 held that the normal direction of the first portion of the jejunum lies downward and to the left while Moynihan in 1905 claimed that it was downward and to the right. Lewis in 1909 referred to the teachings of Jonnesco and advocated approximating the jejunum to the stomach in accordance with the way in which it lies in each case. Finally, the end of the stoma should approximate the greater curvature in order to obtain adequate gastric drainage.

Remembering that an unknown but significant number of patients will require additional surgery after gastro-enterostomy, Lahey (54) advises planning the original operation so that the required secondary intervention will be facilitated technically. He recommends an afferent jejunal loop of sufficient length so that subsequent jejunal resection will be feasible should gastrojejunal ulceration follow. Not only should the slit in the mesocolon be selected so that kinking and pulling are avoided but it should be placed as far away from the transverse colon as possible. This will not only decrease the tendency toward the formation of a gastrojejunal fistula, but also reduce the technical difficulties of the second intervention. Careful suturing of the slit in the mesocolon on the stomach far enough above the anastomosis to prevent kinking or obstruction of the jejunal loops is important. Appreciating this the younger surgeon will have less difficulty in deciding where and how to make a gastro-enterostomy.

Kalk (50) believes the prognosis following gastro-enterostomy depends upon postoperative gastric physiology. He presented some interesting data and theories in attempting to clarify the pathogenesis of gastrojejunal ulceration. In his opinion regurgitated neutral duodenal secretion has little effect upon the acid secreting capacity of the stomach. The reduction of gastric acidity however is proportionate to the quantity of duodenal secretion regurgitated into the stomach. The effect of the duodenal secretion varies greatly with the particular type of gastro-enterostomy; it is least effective following the Braun type of anastomosis. Other changes occurring in the stomach after this operation are more important. After gastro-enterostomy every patient develops a very severe postoperative gastritis from the duodenal regurgitation. The gastric secretory

changes may take one of two courses. First, an atrophic gastritis with an associated diminution of acid secretory capacity may develop, and the patient remain healed and free from ulcer symptoms. Second, acid gastritis may develop with new elevation of the gastric acid values and the patient develop a jejunal ulcer or a recurrence of the original lesion.

Postoperative observation of a patient with a gastro-enterostomy may therefore aid in anticipating subsequent ulceration. In individuals with a high acid secretion rigid medical care should serve as a useful prophylactic.

GASTRIC ULCER-CARCINOMA

The surgical therapy of gastric ulcer is influenced to a great extent by the incidence of carcinoma in this type of ulcer. Despite the fact that many careful and practical studies have appeared in recent literature, our knowledge on this subject has made no significant progress, with perhaps the exception that today we are at least aware of what is still to be learned.

Bloomfield (8) has presented only too clearly the difficulties in differentiating between a gastric ulcer and a gastric carcinoma. He has attacked the implication that a careful study of patients with ulcers which appear benign should make it possible to detect early malignant changes and effect a cure by radical surgical therapy. His objective was to analyze this contention and determine its validity. If every individual over forty years old had his stomach examined biennially to detect early lesions, he questions, "would a sane radiologist have the temerity to advise exploration on the strength of dubious x-ray appearance?" In addition he shows that the failure of ulcer symptoms to respond to therapy in 92 consecutive cases of cancer of the stomach was of little practical value as a basis for the suspicion of malignancy. Moreover the failure to respond to medical therapy did not conclusively prove the lesion to be malignant. Decrease in size of a gastric lesion under therapy as determined radiologically is not an infallible sign. In two of his malignant cases the ulcer seemed smaller at the very time when the cancer was extending through the wall of the stomach.

He concludes that none of the criteria proposed for the detection of an early malignant change in gastric ulcer is reliable in the individual case which is of specific interest to the practitioner. It is impossible even after the most careful study and observation to be sure whether early cancerous changes have occurred in an apparently benign peptic ulcer. If in brief it is impossible

to differentiate between benign and malignant ulcers until late, when obvious evidences of carcinoma are present, the *point at issue* is whether or not all gastric ulcers should be resected as soon as recognized as a prophylactic measure against subsequent cancer. This decision should rest upon whether the hazard of cancerous change in ulcer is greater than the risk of operation. Bloomfield believes that the general opinion found in the literature is that probably not more than 5 per cent of apparently benign peptic ulcers are malignant. Gastric resection, however, involves an operative mortality of at least 10 per cent in skilled hands, and this figure could be doubled if operations done by surgeons in general were included. In addition, even if resection is accomplished, it is still necessary to reckon with the possible recurrence of ulcer, and postoperative complications such as adhesions, obstruction, and persistent indigestion. Finally, operation does not always save the patient from cancer even when only the earliest malignant changes are present. Bloomfield cites 68 cases reported from the Mayo Clinic in which malignancy could be demonstrated only microscopically and in which there were 36 deaths (52.7 per cent) presumably from recurrence.

The difficulty of differentiation between a benign or inflammatory gastric lesion and a neoplastic lesion has been emphasized by Cole (17) in a most stimulating essay on this subject. Cole presented histological sections of eight organic lesions to a group of preeminent pathologists. The differences of opinion and the possibilities of error in determining accurately whether these gastric lesions were benign or malignant are shown by his case reports. Not only did the pathologists frequently fail to agree in their diagnosis, but the ultimate course of the lesions occasionally proved them to be in error. From Cole's work the average surgeon will be forced to conclude that even his most reliable guide, the pathologist, may be wrong, and that only the outcome truly settles the diagnosis. Cole, however, holds forth one ray of hope. His detailed study of these eight cases afforded him data which he will present in a subsequent article containing pathological criteria helpful in determining an accurate histological diagnosis.

Granting then that "no pathognomonic signs are invariably present in gastric carcinoma, the recognition of which permits the early diagnosis of the disease," and realizing that the histological diagnosis is by no means invariably reliable, the surgeon is still faced with the problem of treating these lesions in the most satisfactory manner

(Rivers and Dry 76). For practical purposes criteria may be adopted for the differentiation between malignant or neoplastic and inflammatory or benign lesions, such as were outlined by Jordan (48) or by Scott (82). For the doubtful cases Jordan and Scott recommend hospitalization and observation for definite improvement, as determined symptomatically and subjectively with the x-rays, and for absence of occult blood in the stools in about three weeks. Lesions which continue to improve and eventually disappear, as determined with the x-rays, are considered benign. Surgical intervention is indicated if at any time either during therapy or the subsequent observation period, the symptoms recur or the size of the ulcer niche increases.

Landon (56) believes that today from 98 to 99 per cent of all patients with gastric carcinoma eventually die of this disease. According to Balfour (4), after a wide resection 52 per cent of the patients with disease confined to the stomach, and 19 per cent with additional involvement of the lymph nodes were alive and well after three years. In the cases with or without lymphatic involvement in which resection was performed 19 per cent of the patients are alive and apparently well at the end of five years.

The achievement of five-year cures of 20 per cent of all gastric carcinomas which are still operable, becomes less enviable when we find that about 50 per cent of all gastric carcinomas are inoperable when they reach the surgeon. The gastroscope may, according to Schindler (80), be a factor not only in differentiating between benign and malignant gastric lesions, but also in diagnosing the latter "while the carcinoma is still localized in the gastric wall." This "permits us to decide on the operability of the gastric cancer."

GASTRITIS

Walters and Church (91) have attempted to explain the reason for the different surgical opinions held in Continental Europe on the one hand, and in England and America on the other. They have studied a group of gastric specimens resected by Schmieden in Frankfurt. These specimens consistently showed varying degrees of antroduodenitis as described by Konjetzny and his coworkers.

The Mayo investigators then studied a series of 27 of their own cases of duodenal ulcer in which a partial gastrectomy was performed. Twenty-four of these 27 specimens showed a normal gastric mucosa. This low incidence of gastritis in the patients seen in Minnesota was explained by Walters as being secondary to a lesser degree of disease in midwest American patients. "The Ger-

man patients had a much more severe degree of duodenal ulceration than those we are accustomed to see in the Mayo Clinic. Walters believes also that the German type of gastritis is secondary to large ulcers producing pyloric obstruction by hypertrophy of the gastric wall with edema. This opinion was confirmed by finding gastritis in 11 of 12 patients who had gastric carcinoma with obstruction of the pylorus. In a group of 12 patients with gastric carcinoma without pyloric obstruction 10 (83 per cent) showed no gastritis. Walters and Church therefore conclude: "It appeared that gastritis occurred with pyloric obstruction and was absent when pyloric obstruction was not present."

Many Continental investigators and clinicians believe that gastritis is a precursor of marginal ulcer after gastro-enterostomy, but Walters referring to the work of Dragstedt on Pavlov pouch jejunal ulcers and to the studies of Mann concludes: "The reduction in the incidence of gastro-jejunal ulceration obtained by subtotal gastric resection, under and below that following gastro-enterostomy is due to a greater reduction of gastric acidity occurring subsequent to subtotal gastrectomy."

Kinborn (26) having first considered the rôle played by chronic gastritis in the etiology of gastric ulcer, submits the question, "Is the new theory correct that chronic gastritis is etiologically the basis of peptic ulcer?" In his opinion the syndrome in chronic gastritis is entirely different in course and degree than that found in peptic ulcer. In chronic gastritis the gastric acid values are either normal or there is a hypoauidity. The symptoms also fail to show the alternating course of occurrence with activity and latent periods found in the patient with ulcer. In a histological study of 7 patients with peptic ulcer and 7 patients with carcinoma of the stomach he found chronic gastritis usually associated with cancer of the stomach and proliferation of the glands was often found in conditions of hyperchlorhydria. This led to the conclusion that hyperchlorhydria played a greater part in the appearance of peptic ulcer than chronic gastritis apparently confirming Walters' opinion.

Simpson (84) gave 161 patients with ulcer a fractional test meal on one or more occasions within a period of two weeks prior to the subsequent operation. The objective in this study was the comparison of the morphology with the functional activity a subject upon which no series of figures exists. He found a gastritis in every case of peptic ulcer wherever the ulcer was situated. In 140 cases an extensive gastritis was always found at

the proximal margin of resection where it was so far away from the site of the major organic lesion that it seemed quite unjustifiable to say it was initiated by the lesion. When gastritis is found appreciably developed in 100 per cent of biopsy specimens of ulcer and cancer, irrespective of the length of the history or size of the growth there is strong evidence that it was the precedent and not the result of the major lesion. His fractional studies showed a predominance of hyperchlorhydria in cases of erosive gastritis, chronic gastritis and chronic duodenal ulcer.

Simpson concluded that the hyperchlorhydria is in itself harmless, but that the added gastritis of even mild severity may precipitate erosive changes and ulceration. The purpose of his article is to again emphasize, "The importance of gastritis and hyperchlorhydria singly and together in the production of erosive lesions and peptic ulcer." These observations suggest that gastritis and ulcer may consistently be found together in the English material and that gastritis is an important factor in the development of ulcer.

Bland (7) also found gastritis 'ever present' in his material at Cleveland. Even with the naked eye he found high grade gastritis and duodenitis in all specimens of stomach removed by resection. He believes that in the healing of a peptic ulcer "The new and delicate granulations are infected and quickly destroyed by the omnipresent gastritis and duodenitis and treatment to combat peptic ulcer successfully must cure the destructive gastritis and duodenitis." In his opinion this is accomplished only by radical resection.

The observations of the last two writers certainly are contrary to the finding of Walters. From the recent literature one can conclude only that the incidence of gastritis must be determined more accurately before it can be used as a guide in the selection of surgical therapy for the treatment of American and English patients with gastroduodenal ulcerative disease.

COMPLICATIONS

Perforation. The treatment of perforation of gastroduodenal ulceration has in the past been limited to simple closure of the perforation and to closure with some palliative measure usually pyloroplasty or gastro-enterostomy. Within the last three years this conservative type of treatment has been questioned in view of the publication of statistics of unusually good results obtained by gastric resection performed on patients in reasonably good physical condition.

Yudin (95) has come forward as one of the most enthusiastic advocates of gastric resection for per-

foration. He found a slow increase in perforation beginning in the second half of the winter, reaching its height at the end of the spring, and followed by a decline which reaches its depth about midsummer. This seasonal variation he assumed to be caused by a relative avitaminosis due to the decreased use of vegetables and fruits during the winter.

The mortality in his first 673 partial gastric resections performed for perforation in the course of six years was 9.8 per cent. The next 331 resections which he performed for perforation during 1933 and 1934 had a mortality of 7.8 per cent, and the mortality in 121 resections performed in 1935 decreased to 6.6 per cent. Yudin stresses the necessity of selecting patients for resection. They must be under forty-five years of age and present a recent perforation. An experienced surgeon, properly trained assistants, and spinal anesthesia must be available. This progressive decrease of the surgical mortality is certainly strong evidence in favor of resection for perforation of gastroduodenal ulceration in favorable cases. It may be of interest to conjecture whether this mortality would have been even lower had Yudin selected the more conservative surgical routine usually adopted for this condition. However, his results when contrasted with those of other authors are worthy of consideration.

Lang's report (57) on his observations on 152 patients is of interest because of its marked contrast to that of Yudin. Lang notes that in the last ten years the incidence of perforation has increased in large urban hospitals, which fact has been repeatedly confirmed by others. He confirms Yudin's observations that the majority of perforations occur in winter. Forty-five per cent of his patients were operated on within the first six hours, 20.2 per cent within from six to twelve hours, 9.2 per cent within from twelve to eighteen hours, and the remainder later. Early operation was therefore possible in only one-half of his cases. The most effective therapy was simple closure, gastro-enterostomy was added only when stenosis appeared inevitable. His total mortality of 40.6 per cent was attributed to the delay between perforation and surgical intervention. Half of the mortality in this group of poor risks was secondary to peritonitis. In 4 patients the suture line leaked, in 5 a second perforation was overlooked, and in 2 death occurred from a late postoperative perforation of another ulcer.

When Lang's mortality of 40.6 per cent is contrasted with Yudin's 6.6 per cent it may at first seem that the former is due to the radical difference in the type of surgical intervention, but

further analysis of Lang's statistics shows that approximately 6 per cent of the patients were moribund on their admission to the hospital and therefore no surgical treatment was attempted. A critical analysis permits the question whether resection would have decreased Lang's mortality or perhaps even have increased it?

The statistics reported by Butler (15) on the treatment of perforated ulcer in the San Francisco Emergency Hospital show that he takes a position approximately midway between that of Lang and that of Yudin. In the 251 cases of perforated ulcer treated by Butler the mortality was 24.51 per cent, but there were only 6 deaths in the cases operated within six hours after perforation. Simple closure or closure with gastro-enterostomy gave the same results in 70 cases of perforated duodenal ulcer which did not present large caloused lesions. Eighty-five per cent of these patients remained symptom-free when on a careful diet.

A group of 63 cases of acute perforated ulcer reported from Philadelphia by Corff (18), showed that simple suture of the perforation with additional surgery at a second operation is the safest procedure. In the 22 cases operated within six hours after perforation, the mortality was 9 per cent. In a group of 22 cases operated from six to twelve hours after perforation, the mortality was 18 per cent. In 4 cases operated after from twelve to eighteen hours the mortality was 25 per cent, and in 7 cases operated after from eighteen to twenty-four hours, the mortality was 85 per cent. The average mortality was 28.8 per cent; and the operative mortality was 25.8 per cent as one patient died without surgical intervention. This approaches the average mortality for the United States which has been previously reported as 25.9 per cent by Eliason and Ebeling. The Temple group also note that their mortality of 50 per cent in 1923 was reduced to 18 per cent in 1934.

Brenner of New York (12) reported on 41 cases studied at the New York Post-Graduate Hospital. The significance of his observations rests upon the fact that the narrowing or obstruction of the duodenum following closure was ultimately found to cause little or no obstruction. The lumen of the duodenum may be reduced to half its size without causing functional narrowing. In his experience, a duodenum which admits the tip of the little finger after closure will cause no organic obstruction. In 4 of his patients who were relaparotomized later, he found a normal-size duodenal lumen despite the fact that at the primary operation it was definitely narrowed. From his

man patients had a much more severe degree of duodenal ulceration than those we are accustomed to see in the Mayo Clinic. Walters believes also that the German type of gastritis is secondary to "large ulcers producing pyloric obstruction, hypertrophy of the gastric wall with edema. This opinion was confirmed by finding gastritis in 11 of 12 patients who had gastric carcinoma with obstruction of the pylorus. In a group of 12 patients with gastric carcinoma without pyloric obstruction 10 (83 per cent) showed no gastritis. Walters and Church therefore conclude, 'It appeared that gastritis occurred with pyloric obstruction and was absent when pyloric obstruction was not present.'"

Many Continental investigators and clinicians believe that gastritis is a precursor of marginal ulcer after gastro-enterostomy, but Walters referring to the work of Dragstedt on Pavlov pouch jejunal ulcers and to the studies of Mann concludes: 'The reduction in the incidence of gastro-jejunal ulceration obtained by subtotal gastric resection under and below that following gastro-enterostomy, is due to a greater reduction of gastric acidity occurring subsequent to subtotal gastrectomy.'

Einhorn (26) having first considered the rôle played by chronic gastritis in the etiology of gastric ulcer, submits the question: 'Is the new theory correct that chronic gastritis is etiologically the basis of peptic ulcer?' In his opinion the syndrome in chronic gastritis is entirely different in course and degree than that found in peptic ulcer. In chronic gastritis the gastric acid values are either normal or there is a hypacidity. The symptoms also fail to show the alternating course of occurrence with activity and latent periods found in the patient with ulcer. In a histological study of 7 patients with peptic ulcer and 7 patients with carcinoma of the stomach he found chronic gastritis usually associated with cancer of the stomach and proliferation of the glands was often found in conditions of hyperchlorhydria. This led to the conclusion that hyperchlorhydria played a greater part in the appearance of peptic ulcer than chronic gastritis, apparently confirming Walters' opinion.

Simpson (84) gave 161 patients with ulcer a fractional test meal on one or more occasions within a period of two weeks prior to the subsequent operation. The objective in this study was the comparison of the morphology with the functional activity, a subject upon which no series of figures exists. *He found a gastritis in every case of peptic ulcer wherever the ulcer was situated. In 140 cases an extensive gastritis was always found at*

the proximal margin of resection where it was so far away from the site of the major organic lesion that it seemed quite unjustifiable to say it was initiated by the lesion. When gastritis is found appreciably developed in 100 per cent of biopsy specimens of ulcer and cancer, irrespective of the length of the history or size of the growth, there is strong evidence that it was the precedent and not the result of the major lesion. His fractional studies showed a predominance of hyperchlorhydria in cases of erosive gastritis, chronic gastritis and chronic duodenal ulcer.

Simpson concluded that the hyperchlorhydria is in itself harmless, but that the added gastritis of even mild severity may precipitate erosive changes and ulceration. The purpose of his article is to again emphasize 'The importance of gastritis and hyperchlorhydria singly and together in the production of erosive lesions and peptic ulcer.' These observations suggest that gastritis and ulcer may consistently be found together in the English material, and that gastritis is an important factor in the development of ulcer.

Blahd (7) also found gastritis ever present in his material at Cleveland. Even with the naked eye he found high grade gastritis and duodenitis in all specimens of stomach removed by resection. He believes that in the healing of a peptic ulcer 'The new and delicate granulations are infected and quickly destroyed by the omnipresent gastritis and duodenitis, and treatment to combat peptic ulcer successfully must cure the destructive gastritis and duodenitis.' In his opinion this is accomplished only by radical resection.

The observations of the last two writers certainly are contrary to the finding of Walters. From the recent literature one can conclude only that the incidence of gastritis must be determined more accurately before it can be used as a guide in the selection of surgical therapy for the treatment of American and English patients with gastroduodenal ulcerative disease.

COMPLICATIONS

Perforation. The treatment of perforation of gastroduodenal ulceration has in the past been limited to simple closure of the perforation and to closure with some palliative measure usually pyloroplasty or gastro-enterostomy. Within the last three years this conservative type of treatment has been questioned in view of the publication of statistics of unusually good results obtained by gastric resection performed on patients in reasonably good physical condition.

Yudin (98) has come forward as one of the most enthusiastic advocates of gastric resection for per-

Reschke (74) reports the statistics from a group of Berlin hospitals for the period from 1934 to 1935. There were 98 fatalities, a mortality of 9.8 per cent, in a total of 1,023 patients with ulcer complicated by severe hemorrhage. He quotes Finsterer who has had a 5 per cent mortality from radical intervention for bleeding from gastroduodenal ulceration. Von Haberer is quoted as saying that surgical intervention is indicated in cases with severe hemorrhage and in which a peptic lesion has been previously diagnosed, but when the diagnosis is not positive the treatment should be conservative. Reschke is of the opinion that the responsibility for the patient with a severe hemorrhage should be borne by both the surgeon and the internist. When the internist concludes that he can do no more for the patient, the surgeon should operate promptly after giving adequate transfusion.

Finsterer's position (32) is that the surgeon should consider surgical intervention only for the cases presenting severe hemorrhage and should not be influenced by the statistics presented for all hemorrhages. He believes that when a large vessel is eroded, surgery is indicated. In his opinion, the diagnosis is not difficult. When in doubt, an exploratory operation under local anesthesia is indicated. It is not proper to say that the results of medical treatment are better than those obtained with surgical means because a comparison is made between cases of entirely different degrees of severity. He admits that neglected cases which have bled or had recurrences of hemorrhage for more than forty-eight hours have a high surgical mortality, but in a series of 57 cases operated within forty-eight hours, the mortality amounted to 5 per cent. In 55 cases which were operated late the mortality was 32.7 per cent.

Ingegno (46) submits a study of the blood urea in 42 cases of hemorrhage due to peptic ulcer. His findings and conclusions may prove to be a valuable guide in differentiating the patients who should be operated on from those who can be expected to recover without intervention. He found that the blood urea was elevated above normal if studied within three days after an acute gastro-intestinal hemorrhage. In the uncomplicated cases the azotemia does not reach uremic proportions and plays little, if any, part in the symptoms. The outcome will probably be unfavorable in cases with continued hemorrhage and a persisting or increasing elevated urea content. The use of this diagnostic aid in cases which are not doing well may serve as an indication for radical intervention.

Hinton's outline of therapy of gastroduodenal ulceration complicated by hemorrhage affords a practical scheme (42). Hinton does not believe that hemorrhage itself is an indication for surgical intervention except in a selected group of cases in which the hemorrhage may be classified as follows.

1. Hemorrhage occurring in patients with peptic ulcer under competent medical management. In this group "surgical intervention is desirable after the patient has recovered from the acute hemorrhage and is properly prepared for operation."

2. Hemorrhage in patients operated upon for acute perforation, or with a chronic ulcer who have not bled until months or years following the operation. In this group the condition is more difficult to treat, and unless the patients have had two or more hemorrhages another surgical intervention should not be considered as the hemorrhage has occurred in spite of previous surgery and possibly as a result of it. Therefore, the patient cannot be given much assurance that the bleeding will not recur.

3. Hemorrhage which occurs in ulcers that have previously been operated upon for hemorrhage and continues to recur. In this group we have the most difficult type of hemorrhage to treat. Despite several operations including an occasional resection, and in spite of multiple operations, the hemorrhages have continued and for that reason operation should not be attempted unless a definite marginal ulcer can be demonstrated.

4. Severe hemorrhage in patients with a negative or a very short history and who did not know they had an ulcer until the hemorrhage occurred. In this group the patient may have a severe hemorrhage and die suddenly. This is the type of case in which it is difficult to decide whether operation or conservative treatment is best if repeated transfusions have caused improvement in the condition. *When one operates early the ulcer must be excised even if a gastric resection must be done, otherwise surgical intervention is of no avail.*

5. Hemorrhage in patients having long histories of ulcer but without regulated medical management. Hinton believes that the average surgeon usually thinks that the long history plus the hemorrhage warrants surgery, but such is not the case. These patients have not received any regulated medical care and it is unusual for them to be admitted for a second hemorrhage. The results of conservative treatment have been sufficiently encouraging that operation is not recommended for the first hemorrhage.

observations the conclusion may be drawn that narrowing of the duodenum following closure of the perforation is more apparent than real and that ultimately the duodenum will be functionally adequate.

The acute perforation of a secondary ulcer following gastro-intestinal surgery is also extremely serious. Wright reported (97) that there were 48 such secondary ulcer perforations in 458 cases of postoperative ulcer. The patients were treated by suture of the perforation. Eleven (almost 25 per cent) died, 15 required further surgery and a very small number recovered and remained free from symptoms.

Graham (39) states that the surgeon must first make or confirm the diagnosis of acute perforation in a duodenal ulcer. The lesion which creates a hazard to life must be treated in the most simple manner. The surgeon's sole responsibility is to save the patient's life. At this time he does not have the responsibility of curing the ulcer. Graham used only 3 interrupted sutures tied over a free omental graft. Any operative procedure directed toward cure of the ulcer is unsound, meddlesome and adds greatly to the mortality as well as to the morbidity. Graham has been impressed by finding a large number of jejunal ulcers in patients in whom a gastro-enterostomy had been performed at the time of closure of a perforation. Since July 1, 1929 his group have operated upon 30 consecutive perforated duodenal ulcers without a death. Sixteen of the patients required a subsequent operation: 7 a partial gastrectomy, 7 a gastro-enterostomy and 2 a cholecystectomy. There was no operative mortality.

The statistics reported by Graham certainly afford conservative surgeons a basis for continuing to avoid the radical type of intervention.

Hemorrhage. The treatment of hemorrhage in gastroduodenal ulceration has received a new impetus in the past three years. Babey and Hurst (2) were prompted to report their results because of two articles which appeared in the *Lancet* in the fall of 1933. The first of these by Gordon Taylor (38), surveyed the records of the Middlesex Hospital for the years from 1924 to 1933. A mortality of 21 per cent was reported for medically treated cases of peptic ulcer admitted for hematemesis. In the patients who had another large hemorrhage shortly after admission the mortality rose to 78 per cent. Six weeks following this publication Meulengracht of Copenhagen submitted his statistics (66) which were in striking contrast to those of Gordon Taylor. He reported on a total of 257 cases of bleeding ulcer which were treated medically with a mortality of

1 per cent. This low mortality was attributed to the routine of feeding the patients very soon after the initial hemorrhage.

Babey and Hurst report their own results from Guy's Hospital and the New Lodge Clinic. Of a total of 371 cases of chronic gastric, duodenal and anastomotic ulcers admitted to Guy's Hospital during the years from 1919 to 1935, 82 (22 per cent) presented hemorrhage. In 32 (39 per cent) of these 82 and in 106 (29 per cent) of the total of 371 there was a previous history of hemorrhage. Of the 82 patients admitted for hemorrhage, 54 (66 per cent) had gastric ulcers, 22 (26 per cent) had duodenal ulcers and 6 (8 per cent) had anastomotic ulcers. Fifteen of the 82 patients had at least one more hemorrhage during hospitalization. Five of the 15 died, 4 as the result of continued bleeding and one nine weeks following the hemorrhage after surgical intervention. The mortality in 6 cases in which hemorrhage recurred during treatment increased to 27 per cent, but the 4 patients who died of the continued bleeding represented the only fatalities in the entire series directly attributable to hemorrhage. The mortality in the entire group of cases with hemorrhage was therefore 4.8 per cent. The mortality during hemorrhage in cases admitted for hemorrhage or with a history of one or more hemorrhages was 2.5 per cent. Therefore the mortality for hemorrhage in a total of 371 patients with ulcer including those who had never bled, was 1.1 per cent.

In the New Lodge Clinic 586 cases of ulcer had been admitted since 1921. One hundred and sixty-one (27.5 per cent) were admitted with hemorrhage. In this group there were 3 patients with duodenal ulcer who died from hemorrhage. They were the only ones recognized as being unlikely to recover from medical therapy and therefore the only 3 operated upon while still bleeding. None recovered from the surgical intervention.

The general conclusion of Babey and Hurst is that the approximate incidence of hemorrhage in hospitalized patients with ulcer is 27 per cent. They believe that the mortality has been grossly exaggerated as it is only about 1.5 per cent. Hurst does not believe that it is difficult to recognize the rare case of bleeding ulcer which will not respond to medical therapy. He says unfortunately they are the same cases as those in which direct treatment of the bleeding point by operation is likely to be impossible so that even when the operation is performed by surgeons of great experience and the patient has been adequately prepared by transfusion the postoperative mortality must be extremely high.

getting better surgical results since choice of operative procedure has been guided by a knowledge of the possible results and since the post-operative care is applied early and is kept up. We have long since rid ourselves of the notion that one form of therapy is superior to all others. We recognize that success depends on an acquaintance with all forms and the ability to use whichever fits the individual case. None of the present methods of treatment does more than assist in the reduction of remissions no matter how strict the medical schedule nor how radical the operation. Surgical procedures produce longer periods of freedom from symptoms than does the medical treatment, but the former also carry a definite threat to life and often produce mechanical situations which make subsequent attacks difficult to control. During periods of hypersecretion the patient is to be treated with particular care medically, operation at such times is disastrous."

This study showed that peptic ulcer does not tend to shorten the victim's life. The average age at death of 87 patients who died of ulcer was fifty-nine years, which is the life expectancy of the general population. It was likewise re-assuring to find that a peptic ulcer has little tendency to become worse as time goes on.

The favored medical therapy consisted of a protracted rigid Sippy routine, the administration of alkaline powders and insistence on a strict diet as often as necessary without losing faith in the treatment or resorting impatiently to more radical measures because of relapses. Emery and Monroe have come to the conclusion that the disease tends to persist throughout life when it has once been established.

In the past three years interest in mucin therapy has been stimulated by the research of Henning and Norpoth (41), Boldyreff (9), Bradley and Hodges (10), Burger, Hartfall and Witts (14), Deloyers (21), Anderson and Fogelson (1), Florey and Harding (33), Necheles and Coyne (69), and others.

Florey and his coworkers studied isolated duodenal pouches. They investigated duodenal physiology as well as the mucoid material secreted by Brunner's glands. Bradley and Hodges demonstrated that mucin inhibits peptic digestion; Anderson and Fogelson that there is a relative deficiency of mucin in the gastric secretion of patients with active duodenal ulcer.

Henning and Norpoth reported good results in the treatment of calloused duodenal ulcer with gastric mucin. Jones (47) has found mucin of value "in the treatment of 30 patients, a number of them intractable cases." Dunham (24) may

be quoted as follows: "During an experience of thirty-three years, in the medical treatment of peptic ulcer, I have found no remedy as reliable as gastric mucin. Several otherwise intractable cases have been relieved of all symptoms, have gained weight and a condition of euphoria by its use. Some patients suffer recurrences when this product is discontinued. However, even if it proves to resemble insulin in this respect, we have found a most valuable remedy."

Fijioka (31) reports as follows: "The author produced chemically pure mucin and employed it with excellent results in the treatment of 10 patients with gastric or duodenal ulcers which were not cured by other methods. Subjective symptoms of ulcer disappeared within several days of mucin treatment. Objective symptoms were likewise lost in a few days, i.e., local pain point, Onodera's gluteal pain point and occult bleeding in the feces disappeared. Mucin increased the viscosity of the stomach contents and so decreased free hydrochloric acid. Moreover, it interrupted the experimental production of gastric ulcer due to taurocholic acid. In short, mucin treatment of peptic ulcers is one of the most physiological and reasonable methods."

The Gastric Mucin Committee of the Northwestern University Medical School (34) attempted to evaluate mucin for the treatment of peptic ulcer by a questionnaire in which particular emphasis was placed upon so-called "intractable ulcer," which did not respond to other types of treatment. Data on 226 patients were compiled. In 69 of these surgical therapy had given only temporary relief, or no relief at all. In this group of 226 patients with intractable ulcer, mucin therapy was successful in controlling all of the symptoms in 137 (60.6 per cent) and partially benefiting 64 (28.2 per cent); but failed to give relief in 25 (11.1 per cent). Special attention was called to 56 cases with a previous gastro-enterostomy. In this postoperative group, mucin therapy controlled all subjective symptoms in 36, gave partial relief in 16, and no relief in 4.

The most serious objection to mucin therapy has been its physical characteristics and the reluctance on the part of some patients to continue taking it. Its preparation in a granular form which may be ingested without suspension in a vehicle may overcome this criticism.

The physiological rationale of gastric mucin in the treatment of peptic ulcer has led to other attempts to solve the "ulcer question" by organo-therapeutic routines. Ivy and his coworkers (72) have isolated a substance from the small bowel which they call "enterogastrone." This substance

MEDICAL THERAPY

Although it is not within the province of this review to cover adequately the medical treatment of gastroduodenal ulcerative disease, new developments must be considered because of their significance. Within three years after Weiss and Aron published their original work on histidine in the treatment of peptic ulcer (93) there appeared about 150 articles on the subject. Some of the authors are enthusiastic about this form of therapy. Enough data have been compiled to suggest that caution and further clinical evaluation are required before this therapy is either adopted routinely or employed as a substitute for other orthodox regimens.

Barry and Florey (5) and many other investigators have attempted to confirm Weiss and Aron's original experimental results. Experimentally histidine has proved of little value in preventing or even delaying the ulcer which occurs following internal duodenal drainage or the Meckel's diverticulum type of preparation in which a Pavlov pouch drains into the jejunum.

On the other hand, clinical reports from Bulmer (13), Davis (20), Gardiner (37), Maddox (60), Mogena (67), Toro (86), Volini and McLaughlin (88), Wilhelm and Hashinger (94), and many others gave encouraging results in the treatment of ulcer with histidine monohydrochloride.

Sandweiss (78) treated 53 patients with peptic ulcer with a diet and alkali regimen and 40 with histidine alone. Of the patients treated with a diet and alkalis 51 per cent became symptom free and 20.7 per cent were moderately benefited. Of the patients treated with histidine 55 per cent became symptom free and 20 per cent were moderately benefited. Of 17 patients treated with histidine after the diet and alkali regimen failed to bring about a remission 52.9 per cent became symptom free and 17.6 per cent were moderately benefited. Of the 9 patients treated with a diet and alkalis after histidine had failed to produce remissions 48.7 per cent became symptom free and 28.6 per cent were moderately benefited. From changing from one treatment to another and trying all means at hand to tire out the ulcer 73.5 per cent became symptom free and 13.4 per cent were moderately benefited. On the other hand a follow up of patients who developed remissions showed that 85 per cent of those treated with histidine developed recurrences of the ulcer symptoms within six months of their treatment. Of the patients who developed remissions after diet and alkalis only 31 per cent returned with ulcer symptoms within six months. The author concludes that the results obtained in these 40

patients did not warrant routine injections of histidine in all patients with ulcer. The expense involved the daily visits to the office for the 24 consecutive injections, the high incidence of recurrence within six months after treatment and what is more important the fact that approximately the same percentage of patients responded favorably to the diet and alkalis without histidine injections, all contra indicate the routine use of histidine.

Kirby (51) in a similar type of study reached the conclusion that the clinical improvement following histidine hydrochloride therapy in acute peptic ulcer seems to be symptomatic. Chronicity and rhythmicity are characteristic features of peptic ulcer. Histidine appears to have no effect other than to alter the rhythm slightly. The extravagant claims made for this substance seem to be unwarranted.

The only conclusion that may be drawn from these conflicting data is that histidine is probably as effective as diet and alkalis in relieving the symptoms of the patient with ulcer. Experimental ulcers were unaltered by histidine therapy but the same type of experimental lesions are practically unaltered by alkalis and diet. The clinical results seem to be the same. On this basis an attitude of nihilism is equally applicable toward histidine and toward alkalis and diet.

The critical survey by Emery and Monroe (27) of 1,435 cases of ulcer reviews both the medical and surgical results and presents the surprising conclusion that surgical intervention appears to be just as unable to alter the course of peptic ulcer as medical treatment. Tabulated statistics compiled from the authors' material seem to warrant this conclusion. One thousand and eighty-five patients were treated medically and 480 surgically.

Result	1,085 medical cases Per cent	480 surgical cases Per cent
No symptoms	13.7	19.0
Very few symptoms	36.5	19.3
Definite improvement	30.8	24.8
Improvement	6.3	8.1
No improvement	12.5	28.7
Pain	35.5	41.0
Hemorrhage	8.1	15.2
Obstruction	4.8	8.7
Hypersecretion	6.7	8.7
Perforation	1.1	1.7
Hourglass contractions	6	1.4
Jejunal ulcer		9.7

Emery found that all medical treatment gave better results than the surgical treatment probably because the medical patients received more attention. However Emery and Monroe are

the jejunum stripped of its musculature, or at the usual site. The ulcers were large as a rule and very indurated. Therefore, the significance of muscle spasm in the causation of ulcer is not settled conclusively.

Berman and Baxter (6) wished to learn what might happen if the ulcer-bearing area were brought up into the more acid portion of the stomach. They sought to produce a living transplant of the pars superior of the duodenum in a new and more highly acid environment. They "wished to study the effect of acidity on the duodenal mucosa and the effect of the duodenal mucous membrane upon the physiology of the stomach." The lesser and greater curvatures of the pyloric antrum and part of the duodenum were separated from their attachments. The pyloric sphincter was cut and the duodenum was pushed and sutured in the gastric lumen. The final result was duodenogastric intussusception. Animals sacrificed after seven and nine months showed no significant changes in the duodenal mucosa. The presence of Brunner's glands in the stomach seems to cause an increase of both free and combined acid. The gross increase in quantity and quality of the mucus seems to be due to the higher acid medium created. "In other words, our experiments seem to show that Brunner's glands are stimulated to increase production of mucin by higher acid values and that these same glands in turn, owing to this stimulation, cause an increase in the hydrochloric acid of the stomach. Brunner's glands seem to have two functions, a local protective mucin-producing action and a hormonal acid-stimulating mechanism."

Cincophen was used next to produce experimental ulcer. Peptic ulcer was found in only one of the dogs operated upon after the administration of cincophen. The ulcer occurred without a significant rise in the acid content. They believe "that it is the absence of a sufficient amount of protective influence of mucin rather than the increase in the amount of acid *per se* that is responsible for peptic ulcer." These findings agree with those of Anderson and Fogelson (1) who report a relative decrease of mucin in the gastric contents of patients with active duodenal ulcer, thus supporting the hypothesis that the patient with ulcer is suffering from lack of protection in the presence of excessive irritation from hypersecretion.

CONCLUSIONS

The subject of gastroduodenal ulcerative disease is characterized by a divergence of views on almost every phase of the subject. It is possible to prove

or to disprove with authoritative data from qualified sources almost everything known on the subject. With the physiologists still groping, the clinicians need not apologize for their small percentage of failures.

Notwithstanding the best efforts of internists, there are patients with ulcer who require surgical therapy. Surgeons are today reporting better end-results with a lower surgical mortality in this type of patient. This progress has followed a specific interest in the subject on the part of surgeons who are now concerned with more than the surgical technique. A qualified surgeon must be able to assay the thoroughness and effectiveness of previous medical therapy, must understand the particular patient's gastric physiology, psychic constitution, and economic status, and he must appreciate that there are times when surgery is indicated, as well as times when surgery tempts disaster. When all of these factors are correlated with the local findings at operation, the surgeon should then, and only then, select that type of surgical intervention which in the light of his own previous experiences has been most satisfactory. A continued improvement of the end-results of surgical therapy of gastroduodenal ulcerative disease may be anticipated because more surgeons are now aware of their responsibility in the guidance of all phases of therapy for the patient with ulcer.

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has been purified until it is free from blood pressure depressants. A reliable method for its assay has been devised and its inhibition of gastric secretory and motor activity has been demonstrated. As yet this product is not sufficiently purified for clinical trial.

Following a similar trend, Rivers' contribution on the use of duodenal extract in the treatment of gastroduodenal ulcer (75) is noteworthy. Rivers has found duodenal extract to be an important adjunct in ulcer therapy.

Other interesting forms of therapy are the use of pepsin advocated by Bremer and Strauss (11), vaccines by Sandweiss and Meyers (70), a combination of glycoprotein and emetine known as 'synodol' by Cunha (10), hemoproteins by Levin (58), aluminum hydroxide by Woldman and Rowland (96), and numerous other substances all of which apparently have given satisfactory results in the hands of their proponents.

EXPERIMENTAL STUDIES

Matthews and Dragstedt (63) isolated the Pavlov pouch of the greater curvature of the stomach in dogs. The pouch was then sutured to a loop of small bowel so as to drain into the intestinal tract. They found that gastric juice as secreted by the greater curvature and undiluted by food, saliva or duodenal contents, produced ulcers in the loop of the ileum sutured between the pouch and the rest of the intestinal tract in 100 per cent. These and similar observations were the basis for the conclusion that the term 'peptic ulcer' should be changed to acid ulcer, and that acid secretion is of major significance in the genesis of ulcer (Dragstedt 23).

Schmidt and Fogelson (81) repeated Silbermann's experiments of producing ulcers by sham feeding in esophagotomized dogs but could not confirm his results. After fifty days of sham feeding they augmented the irritation of the gastroduodenal mucosa by introducing 300 c.c. of 36 per cent hydrochloric acid into the stomach twice daily for about fifty days and the sham feeding was continued. The animals were sacrificed between the ninety fourth and one hundred second days. Ulceration was absent in all of the dogs.

Howes, Flood and Mullins (45) investigated the rôle of pepsin in the healing of gastric defects in cats. Under ether anesthesia they cut a defect of 1 c.c. into the mucosa of the posterior antral wall. When the animals recovered from the anesthetic hydrochloric acid with a hydrogen ion concentration of 0.9 was introduced into the stomach. This delayed but did not prevent the

healing of the mucosal defect. Acid of a hydrogen ion concentration of 1 or more had little or no effect upon healing. Pepsin combined with weaker concentrations of acid, however, caused marked necrosis in the floor of the mucosal defect. It also delayed but did not prevent ultimate healing. However, there was greater delay in healing in animals given pepsin plus acid than in those given acid alone.

Matzner, Windwer, Sobel and Polayes (64) contrasted the results obtained by feeding rats (1) pepsin and hydrochloric acid, (2) hydrochloric acid alone and (3) inactivated pepsin and 0.3 per cent hydrochloric acid. In the first group 19 of 20 rats (95 per cent) showed multiple ulcer-like lesions in the pre-stomach; in the second group 3 of 13 (23 per cent) developed gastric lesions and in the third group 2 of 10 (20 per cent) developed gastric lesions. The authors therefore conclude that pepsin is a more important factor than hydrochloric acid in the production of gastric lesions in the rat.

The combined results of Schmidt and Fogelson (81), Matzner, Windwer, Sobel and Polayes (64), and those of Howes, Flood and Mullins (45) suggest that more than acid should be considered in ulcer etiology and that pepsin should not be ignored. Dragstedt's term acid ulcer should perhaps be abandoned at least temporarily pending further confirmatory evidence.

Steinberg and Starr (85) investigated the rôle of spasm in the causation of experimental peptic ulcer. In the preparation of internal duodenal drainage or diversion dogs the jejunum sutured to the stomach was stripped of the circular and longitudinal muscles for approximately 10 cm. A narrow strip of muscle was left at the mesenteric border to preserve the blood supply. This type of operation in control animals gave 100 per cent ulcer incidence. In 10 dogs observed for the same period, no ulceration occurred in the part of the jejunum stripped of musculature for three-fourths of the circumference of the bowel. When the same experiment was repeated using a loop of small bowel attached to a Pavlov pouch, not one of 6 animals developed ulcer. The absence of ulcer in the stripped part of the bowel is presented as evidence that muscular spasm is an important factor in ulcer formation.

Fauley and Ivy (29) repeated Steinberg and Starr's internal drainage experiments but performed an end-to-side type of gastrojejunostomy, whereas Steinberg and Starr performed an end-to-end. With Ivy's modification a lower incidence of ulcer should be expected. Of the 14 animals that were studied, 13 died with ulcer. The ulcers, without one exception, were located in the part of

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layers. The anterior portions of these become separated spontaneously to form the anterior chamber of the eye. The anterior portion of the outer layer of the uvea is Descemet's membrane. At the drainage angle the spontaneous separation of the two uveal layers is incomplete. The trabeculae and some spaces of Fontana are formed as this tissue becomes rarefied. The blood vessels, especially the capillaries and veins in this rarefied tissue called the *ligamentum pectinatum*, become dilated and form the uveal portion of the cavernous plexus. The uveal portion of this plexus persists in the eye of the wallaroo kangaroo, and it sometimes persists for two or three days after birth in the eye of the sasin antelope. In all the other mammals examined the distorted veins and capillaries of the uveal portion of the cavernous plexus, and also the accompanying arteries, break down before birth and form spaces of Fontana. The venous and capillary anastomoses which originally connected the uveal and scleral portions of the cavernous plexus with one another vanish only as far as the relatively dense tissue of the outer layer of the uvea. These vestiges are called *venae vestigia oculi*. They continue to have open mouths, which are called *foramina venarum minimarum*.

After the injection of india ink into the anterior chamber of an eye several hours after the death of the animal, the fluid escapes principally through the *foramina venarum minimarum*, the *venae vestigia oculi*, the anterior portion of the cavernous plexus of the inner sclera, the anterior portion of the mid-scleral plexus, and then through many anastomoses near the limbus into the periscleral plexus.

After the injection of the ink into the anterior chamber of a very fresh eye, some of the fluid escapes as described in the preceding paragraph, but the greater part of it escapes into and through the mid-scleral plexus, unless the injection pressure is great enough to compress and occlude the posteriorly situated veins of this plexus as it is transmitted to them through the vitreous, the retina, the posterior uveal layers, and the cavernous sclera.

The anterior portion of the cavernous plexus ordinarily becomes well injected, because the *venae vestigia oculi* lead directly to it and because its veins, unlike the veins of the posterior portion of the plexus, are not severely compressed by the injection pressure transmitted to them via the vitreous. In some instances, however, the anterior portion of the cavernous plexus does not become injected. In some the ink enters the mid-scleral plexus via some *vestigia oculi* which pass directly from the drainage angle to veins of the anterior portion of the mid-scleral plexus instead of to veins of the cavernous plexus.

By altering the injection pressure in a rhythmic manner, ink can be brought through the walls of the uveal portion of the cavernous plexus, as in the wallaroo kangaroo. Also, by altering the pressure rhythmically, ink can be brought into the posterior region of the cavernous plexus, as in the dog, but

the ink which passes into this part of the plexus enters it via some posteriorly situated anastomoses which connect the mid-scleral and cavernous plexuses with one another. All parts of the cavernous plexus can be injected from either an artery, such as a common carotid artery, or a vein, such as a vorticos vein, if the injection pressure is altered in a rhythmic manner and especially if the intra-ocular tension is maintained at a low level by artificial means.

LESLIE L. MCCOY, M.D.

Ernsting, H. C.: Boeck's Sarcoid of the Eyelid with Co-existing Darier-Roussy's Sarcoid: Report of a Case, with a Review of the Literature. *Arch. Ophthalmol.*, 1937, 17: 493

The author in reporting his case of this very rare but interesting condition summarizes his article as follows:

A case of two different types of sarcoid co-existing in the same person (one of the Boeck type involving the eyelid) has been reported.

An intensive review of the literature has revealed the rarity of mixed sarcoid, as well as the rarity of involvement of the ocular structures.

Sarcoid is a condition characterized by the formation of plaques, both cutaneous and subcutaneous. There are only two types of sarcoid. The lesions usually undergo resolution and terminate in atrophic scar-like areas.

The etiology of sarcoid is unknown. A few consider a filtrable virus the cause. Others think that there is a tendency of the tissues to respond to the invasion of a foreign body by the formation of lupoid tissue. Many consider the tubercle bacillus to be the cause and attribute the negative reaction to tuberculin to a stage of anergy. Most authorities on tuberculosis, however, do not believe the tubercle bacillus to be an etiological factor and are skeptical of the assumed existence of a state of anergy.

Histological study is the only accurate means of making the diagnosis. This should be consistent with or substantiated by clinical findings. The roentgen-rays may be of value as a diagnostic aid.

The prognosis as a rule is good. However, cases in which the condition terminated fatally have been reported.

The treatment is varied. In addition to surgical removal of the tumor of the lid, the patient in the case reported received treatment with a solution of potassium arsenite, roentgen therapy of the chest, and rest. The treatment was apparently successful, and in the course of eight months there has been no recurrence of the lesions. The patient's general health remains good.

LESLIE L. MCCOY, M.D.

EAR

Pfahler, G. E., and Vastine, J. H.: The Treatment of Cancer in the Region of the Ear. *Am. J. Roentgenol.*, 1937, 37: 350

Cancer in the region of the ear is especially serious as the percentage of failures following its treatment is

ABSTRACTS OF CURRENT LITERATURE

SURGERY OF THE HEAD AND NECK

HEAD

King J E J The Treatment of Osteomyelitis of the Cranial Vault *Surgery* 1937, 1 401

This report is based upon King's experience obtained in treating seventeen patients with osteomyelitis of the cranial vault ten of whom survived. Of the seven who died, one probably succumbed to a ruptured brain abscess and six to an advanced stage of widespread bone involvement which was already present when they came to the author. King urges early and repeated x ray studies to locate the osteomyelitic area by its appearance of softening and decalcification before necrosis has occurred. He also stresses the value of ventriculography.

Following the precepts of McKenzie the author advocates the turning down of a large scalp flap over the infected area and a wide removal of bone including normal healthy tissue. After this wide exposure the underlying dura which is practically always diseased may be inspected for an extradural or subdural abscess and if an underlying brain abscess is suspected an ideal exposure for its drainage has been obtained. No bone wax is used but rather the bone edges are packed with iodoform gauze. Gauze soaked in azochloramid is placed over the exposed dura and the skin flap is sutured loosely into place. The gauze packs are retained and irrigated every two hours with azochloramid. They are left in place for six days at the end of which time the flap is raised the dressings on the bone and dura are renewed and the flap is replaced for another four days. Then the flap is raised once more and after all dressings are removed it is sutured loosely in place for the last time. Iodoform wicks are kept in the trough like gaps in the incision until healing is progressing well and then they are gradually removed. Such treatment obviously produces considerable scar formation and deformity but these are treated later by plastic repair. Regeneration of bone is usually good.

JOHN MARTIN M D

Frencckner P Sinography A Method of Radiography in the Diagnosis of Sinus Thrombosis *Proc Roy Soc Med Lond* 1937 30 413

Although several tests have been devised to aid in the diagnosis of sinus thrombosis and to determine whether the right or left side is involved in cases in which the location is in doubt the author has found none of them to be entirely satisfactory. In such instances he injects a 35 per cent solution of perabrodil into the longitudinal sinus and takes roentgenograms in order to determine whether there are abnormalities in the flow of blood from the longitudinal into the lateral sinuses and then through

the jugular bulbs into the jugular veins. He states that by means of special instruments cannulization of the longitudinal sinus can be performed in about ten minutes. Ten cubic centimeters of the perabrodil solution is injected in 2 or 3 seconds and during the last second of injection the x ray exposure is made. The x ray tube is adjusted so that the posterior cranial fossa is projected above the middle and anterior fossa that is an angle adjustment about 30 caudally from the eye ear plane.

The author presents three cases in which the method was employed. In the first a diagnosis of suspected sinus thrombosis was confirmed by the method, the correctness of the diagnosis being demonstrated subsequently by operation. In the second case the method led to an incorrect diagnosis of sinus thrombosis because of an anatomical anomaly in the torcular Herophili. In the third case a diagnosis of creeping thrombosis of the longitudinal sinus was made and operation was not performed. The subjective and objective symptoms disappeared.

ARTHUR S W TOWNSEND M D

EYE

Swindle P F The Principal Drainage Channels of the Eye *Arch Ophth* 1937 17 420

The author summarizes and concludes his very detailed article as follows:

For convenience in discussing the drainage of liquid from the anterior chamber of the mammalian eye the great network of drainage channels was somewhat abstractly divided into the periscleral, mid-scleral and cavernous plexuses. In accordance with this classification the periscleral network consists of the venous anastomoses of the conjunctiva, Tenon's capsule and the episclera. The mid-scleral and periscleral plexuses are associated with one another at many points between the limbus and the equator of the globe by means of venous anastomoses. In the greater number of mammalian eyes these anastomoses are most numerous per unit of area in the vicinity of the limbus. The mid-scleral plexus is also associated with the cavernous plexus at many points between the limbus and the equator and these anastomoses are likewise usually most numerous per unit of area in the vicinity of the limbus.

At many points the cavernous plexus is associated with veins in the iris and the ciliary body. In some eyes the cavernous plexus is also associated by means of a small number of anastomoses with the uveal veins posterior to the ciliary body.

For the sake of convenience in discussing the cavernous plexus the uvea was divided into two

The operative mortality for the entire group amounted to 26.1 per cent, and for those treated by surgery alone, to 28.4 per cent. In the last five years, the postoperative death rate was 16.7 per cent. The lowest mortality rate occurred when "stage" operations were performed. Among the simultaneous tongue and node operations, the postoperative mortality ranged from 43 to 50 per cent.

Twenty per cent of all patients treated by surgery survived five years or over. There were five-year survivals in 32.4 per cent of the cases without node involvement, and in 11.5 per cent of the cases with node involvement. Of three cases treated by a combination of radium irradiation and surgery, one (33 per cent) had a five-year survival.

The best results as to five-year survivals and recurrences were obtained when the tongue was removed first. The next best results followed a simultaneous tongue and node operation. The poorest results were obtained in those cases in which the operation upon the nodes preceded that upon the tongue.

The results as to five-year survivals are over twice as favorable from a bilateral node operation than those obtained from excision of the nodes of the affected side only, and they were even better when there was a complete removal of the node down to the clavicle.

Five-year survivals among the private patients were almost three times as numerous as those among the clinic patients.

Postoperative irradiation was not used as a routine procedure. There were not a sufficient number of cases in which it was employed to form any conclusion as to its value.

In over 10 per cent of the cases in which there was no local recurrence following removal of hyperplastic nodes by an upper node dissection, cervical metastases occurred later on the same side of the neck.

Among the cases treated by radium irradiation and surgery, the results of permanent eradication of the tongue lesion were very poor. Where radium was used for the primary lesion, a permanent disappearance of the cancer was effected in only 10 per cent.

In the treatment of cancer of the tongue no one method should be used to the exclusion of others. Surgery and radium irradiation each have their place, and the selection of the form of treatment in individual cases must depend upon the condition of the patient, the extent and location of the primary lesion, and the radiosensitiveness of the tumor.

Comparison of the results of surgery to those of irradiation in the treatment of the cervical nodes is useless because in irradiated cases cancerous involvement of the nodes is rarely confirmed by pathological examination, and the results of the treatment of "palpable nodes" mean nothing. In unselected cases without node involvement, the author believes he may expect five-year "cures" in over 30 per cent, with node involvement the five-year "cures"

probably average well under 10 per cent. Successful treatment must depend upon keeping ahead of the disease or, in other words, preventing the extension of the disease to the neck. Thorough surgical removal of operable cervical nodes, whether palpable or not, seems a more rational procedure for accomplishing this end than treatment by external irradiation, which is of questionable value except in the presence of very radiosensitive metastases.

A complete summary of the literature is presented

LOUIS T. BYAPPS, M.D.

NECK

Coller, F. A., and Yglesias, L.: The Relation of the Spread of Infection to Fascial Planes in the Neck and Thorax. *Surgery*, 1937, 1: 323.

The authors describe three spaces in the neck lying between muscular fascial planes that are limited by bony attachments to the face and to the thoracic cage. Infections in these spaces are infrequent and are limited sharply to the neck. Between these spaces and the prevertebral muscular fascia lies a large viscerovascular system of fascia in which are four definite fascial compartments and a vascular sheath. The lateral pharyngeal space is a receiving station for infections arising from fascial spaces in the face and pharynx, from which in turn infection may pass to all other compartments of the viscerovascular system. Two other compartments, the pretracheal and the retrovisceral, pass directly into the thorax. Infections passing along the sheath of the vessels will likewise pass directly to the thorax.

The mediastinum may be divided into compartments very simply if the above facts are borne in mind. Immediately behind the sternum is the space commonly called the anterior mediastinum, that is, a retrosternal space occupied by a few lymphatics, fat, and areolar tissue. It is bounded posteriorly by the pleura and its connecting fascia. It is of no surgical importance except in association with trauma and infection arising in the sternum. Posterior to the upper portion lie the thymus and innominate veins with their fascial covering walling off the upper part of the retrosternal space from the neck. Behind this is the space lying between the pleura and pericardium, the pleuroperecardial space, which may be infected from the vascular sheath or from the pretracheal space. Posterior to this space are the ascending aorta and the arch of the aorta with their sheaths. Behind these lies the pretracheal space, and just behind this the retrovisceral space, both of which are of supreme importance because they are the major pathways for the entrance of infection to the thorax. J. DANIEL WILLEMS, M.D.

Womack, N. A., and Cole, W. H.: The Thyroid Gland in Hypoglycemia. *Ann. Surg.* 1937, 105: 370.

The authors report a case of a man 36 years of age who complained of nervousness, tachycardia, dizzi-

greater than that of treatment of cancer of any other relatively superficial portion of the body. It is important that thorough and skillful treatment be applied at the very beginning. Practically all types of tumors are found in this region. The histological types mentioned in the literature and found in the authors' own studies are described at some length. The etiological factors are given brief consideration.

Treatment is always an individual problem and varies with the location, extent, duration and previous treatment of the lesion. Epitheliomas of the pinna should preferably be destroyed by electrocoagulation and then irradiated. Biopsy findings are important for the determination of how irradiation is to be applied. In cases of small basal cell epitheliomas in which destruction extending 2 to 3 mm. beyond any possible or palpable disease is followed locally by an erythema dose of roentgen rays, practically all of the patients are cured. If the disease is found to be of either the squamous cell or basal squamous cell type, high voltage roentgen therapy should be given to the neighboring lymphatics. Rays filtered through a mm. of copper or its equivalent should be used and treatment should be given over a period of from eighteen to twenty four days until a definite epithelitis is produced. Irradiation amounting to 1,000 r should be given before biopsy and all forceful manipulations of the primary lesions.

The majority of epitheliomas involving the region of the parotid gland or the space below the auricle or posterior to the auricle are of the squamous cell type. The authors recommend that treatment should consist of the surface application of radium filtered through 2 mm. of platinum placed at a distance of from 2 to 4 cm. which is to be continued long enough to produce destruction of the surface skin within a period of about three weeks. When radium is not available it is advisable to use high voltage roentgen rays with at least 200 kv. constant potential and at least 2 mm. of copper filtration or its equivalent in Thoraxium filter. Under these circumstances 250 r should be given daily (omitting Sunday) until from eighteen to twenty four of such applications have been made. If these epitheliomas are recurrences which followed previous treatment with the formation of scar and fibrous tissue it is advisable to destroy them by electrocoagulation. This same form of high filtration irradiation is advised when dealing with sarcoma. In all of these cases thorough irradiation must be given to the side of the neck involved extending from the auricle down to the clavicle.

In cancer of the external auditory meatus it is absolutely essential to obtain a microscopic diagnosis. As the lesion is traumatized in the process of obtaining the specimen it is advisable to destroy the remaining diseased tissue by electrodesiccation or curette it away when the specimen is taken and then introduce a capsule of radium sufficient to destroy the surface disease. External irradiation with either radium or high voltage roentgen rays

should be added. Treatment of cancer of the middle ear and mastoid is best carried out by irradiation with high voltage, highly filtered roentgen rays.

The authors summarize their results in 134 patients. Of 88 patients with primary cancer 35 were well for five years or more, 31 were well when last seen from one to four years after treatment, 8 were well for from one to five years and 11 died of intercurrent disease with no recurrence. In 46 patients who were treated for recurrence and whose previous treatment was mentioned the condition responded less favorably, but 17 patients were living and well five years or more after the recurrence was treated.

ADOLPH HARTUNG, M.D.

NOSE AND SINUSES

Graves, T. C. Nasopharyngeal Sepsis in Mental Disorder. *Brit. M. J.* 1937, 1, 483.

Graves summarizes in some detail 2,036 cases of nasopharyngeal sepsis in mental disorder. Tables showing the instances of diseased conditions found and some of the treatment applied are presented and discussed. Eight selected cases are reported.

JAMES C. BEARWELL, M.D.

MOUTH

Morrow, A. S. Cancer of the Tongue. *Ann. Surg.* 1937, 105, 418.

The treatment of tongue cancer at the Skin and Cancer Unit of the New York Post Graduate Hospital is based on the belief that thorough surgical removal of the tongue lesion combined with a block dissection of all the superficial and deep cervical nodes, whether clinically showing evidence of metastases or not, is the most rapid and effective means of eradication and gives the greatest assurance of freedom from recurrence. In general radium and roentgen ray treatment are reserved for the more radiosensitive types of tumors for cases in which prolonged operative procedures are contra-indicated and as a palliative measure for hopeless cases.

A study of the records of cancer of the tongue treated during the last nineteen years was undertaken. A review of the literature on cancer of the tongue for the last five years was also made for comparison. It was found very difficult to make comparisons, however, because of the lack of uniformity in the methods of compiling statistics and the unequal intervals following treatment before the cures were reported.

Ninety-eight cases of microscopically confirmed cancer of the tongue form the basis of this report.

Two-thirds of the cases were advanced cancers in the sense of having spread beyond the limits of the tongue or showing node involvement. Eighty-eight were treated surgically and ten by a combination of radium irradiation and surgery.

Neither the size nor the grade of the tumor proved of much prognostic value among the cases treated surgically.

Epidermoid or squamous carcinoma is a rare type. It may arise primarily in the thyroid gland from metaplasia of the thyroid epithelium or from remnants of the thyroglossal duct. This type is also highly malignant.

Sarcoma is very rare and has not been observed by Graham.

Graham always investigates malignant thyroid disease by ordinary clinical examination, laryngoscopic examination, and x-ray examination of the neck, chest, and esophagus after the administration of barium.

The prognosis varies with the type of tumor. Two of the author's patients with malignant adenoma are alive and well three and three and one half years after treatment, one is alive six years after treatment but has a recurrence, and one patient died after four years of a different cause. One patient with papillary adenocarcinoma is alive and well five years after treatment, one died two years after treatment, and one thirteen years after treatment. All seven patients with spheroidal cell carcinoma died from three weeks to three months after treatment. Two patients with epidermoid carcinoma died three months and six months after treatment, respectively. Four patients with undetermined malignant disease of the thyroid are alive from six to eighteen months after treatment, two of them are well without recurrence.

Graham states that operation is indicated when the diagnosis is made early in cases of malignant adenomas which are still in the intracapsular stage. In advanced cases of carcinoma the condition of the patient precludes active treatment, but operation is indicated for the relief of severe dyspnea due to compression of the trachea. Patients so treated are not likely to live long, but their death will probably be much more tranquil. The results of operation of the anaplastic tumors of the spheroidal type appear to be hopeless with regard to cure. In such cases radiotherapy should be given a trial, but many tumors are radioresistant. In cases of obvious malignant disease of the thyroid characterized by a lower grade of malignancy, operation alone will

rarely eliminate all of the disease. It is doubtful whether it is better to operate and to treat the patient subsequently with x-ray therapy, or to subject him to irradiation alone. It is probably wiser to operate when there is a possibility of removing the growth completely. On the other hand, if the gland is fixed or the growth is so extensive that complete removal is out of the question, Graham believes that x-ray treatment alone should be given. If the tumor is radioresistant, which will be evident in a few days, operation can still be done, although the prospects are not good.

J. DANIEL WILLEMS, M.D.

Hautant, A.: Abnormal Forms of Tuberculosis Simulating Cancer of the Larynx and Their Converse. *J. Laryngol & Otol*, 1937, 52: 65.

In general, tuberculosis of the larynx can be easily distinguished from cancer by 3 principal characteristics. It has numerous situations; it remains superficial, and it leaves the mobility of the vocal cords unimpaired. Moreover, it is accompanied by tuberculous lesions in the lungs, Koch bacilli are found in the sputum, and histological sections show giant cells.

In some cases, however, the condition has the aspect of a warty, subglottic, unilateral lesion, and in some it resembles a ventricular tumor. In both of these types of cases the clinical aspect is that of an intralaryngeal epithelioma and a very careful examination is necessary to avoid error. In the diagnosis of cancer a roentgenogram of the larynx may be a valuable aid. In doubtful cases several biopsy specimens should be removed from different parts of the laryngeal lesion. Deep roentgenotherapy, even as a test treatment, should be resorted to with great caution. Even when the diagnosis of epithelioma seems obvious, an examination of the lungs should be made.

The author presents several illustrations, and several colored photomicrographs of the laryngeal lesions which show the difficulty that may sometimes be encountered in the diagnosis.

J. FRANK DOUGHTY, M.D.

ness and attacks of staggering while walking. For several years he had suffered from increased nervousness and for four years before he was seen by the authors, he had noted vague digestive disturbances such as belching after meals, distention, and constipation. These disturbances were followed by shortness of breath and increased frequency of dizziness. He never lost consciousness.

Physical examination revealed exophthalmos, lid lag, a diffuse enlargement of the thyroid gland and a fine tremor of the tongue. The results of laboratory examinations were normal except for a basal metabolic rate of plus 42 and plus 37. Fasting blood sugars ranged between 60 and 80 mgm. per cent as shown by the Folin-Wu test.

The authors performed a subtotal pancreatectomy in preference to a thyroidectomy. The specimen of pancreas was grossly and histologically normal. There was an increase in the proportion of alpha cells.

After the operation the condition improved; the thyroid gland became normal in size, and the symptoms of which the patient complained disappeared. The fasting blood sugar was increased two months after the operation. No subsequent basal metabolic rate was reported.

The authors believe that the symptoms could be explained on the basis of hypoglycemia. They mention another case with evidence of an interrelationship between the pancreas and thyroid gland. They discuss the literature on the association of increased thyroid activity with hypoglycemia and present these two cases as evidence that an increased activity of the thyroid gland may be a compensatory effort of the body to increase the blood sugar in cases of hypoglycemia.

EARL O. LATIMER, M.D.

Vaux, D. M. *Malignant Tumors of the Thyroid Gland*. *J. Path. & Bacteriol.* 1937 44: 463.

Twenty-five cases of malignant disease of the thyroid gland were found in 722 operations for thyroid disease during a period of three years at the Royal Free Hospital, London, England. There were 7 cases of papillary adenocarcinoma, 4 of carcinoma simplex, 13 of malignant adenoma, and 1 of sarcoma. Photomicrographs of the types are shown.

PAUL STARR, M.D.

Graham, J. M. *Malignant Disease of the Thyroid: Observations on a Series of 20 Cases with Special Reference to Results of Treatment*. *Edinburgh M. J.* 1937 44: 37.

This article is an account of malignant disease of the thyroid, including a report on 20 cases which the author has observed.

Certain features of malignant disease of the thyroid distinguish it from malignant disease of other organs. It is much commoner in regions and countries where simple goiter is in evidence because of the relative frequency with which malignant disease appears in glands previously altered by a simpler

disease. There may be difficulty in distinguishing a benign from a malignant adenoma of the thyroid from the microscopic appearance, and in the presence of very cellular, rapidly growing tumors it may also be difficult to distinguish a carcinoma from a sarcoma. A feature of carcinoma of the thyroid is the tendency of the tumor cells to invade the capillaries and veins, and to spread by way of the blood stream.

In Scotland the proportion of malignant disease of the thyroid in the male to the female is 2:4, and that of simple goiter is 1:9.

There are five types of thyroid malignancy: (1) malignant adenoma or adenocarcinoma, (2) papillary adenocarcinoma, (3) carcinoma (spheroidal cell, medullary, scirrhous, and carcinosarcoma), (4) epidermoid carcinoma or squamous epithelioma, and (5) sarcoma.

Adenocarcinoma commences in a simple goiter or in a normal gland. It is relatively benign. The simplest form is a proliferating adenoma in which the tumor is still encapsulated, but shows increased cellular activity with later penetration of the capsule and rapid progression of the disease. Histologically the cells are arranged in cords or acini without lumens. It may be difficult to decide whether such a tumor is malignant or benign. It has no tendency to invade the regional lymph nodes before the capsule has been penetrated, but metastases may occur by the blood stream even while the tumor is still intracapsular.

Papillary adenocarcinoma may arise in a nodular goiter or in a normal thyroid gland. The tumor may be cystic or solid. Its growth gradually progresses and after the capsule has been penetrated it may reach a large size. This type of tumor becomes fixed in the surrounding tissues and has a tendency to invade the lymph nodes, but metastasis to the bones and distant organs almost never occurs. Histologically the papillary processes are lined by a single layer or by several layers of cuboidal or columnar cells. Infiltration of the capsule clearly indicates the malignant nature of the tumor. The growth is usually slow, often persisting for years and recurring repeatedly after operations.

Carcinoma of the thyroid gland is the most rapidly growing and highly malignant type of tumor. As a rule a rapid massive enlargement takes place where no previous thyroid enlargement or disease was present. Frequently secondarily enlarged lymph nodes are present in the neck and mediastinum and the trachea and the esophagus. The muscles, vessels, and nerves of the neck become compressed and infiltrated with tumor cells. Metastases develop early in the distant parts. The tumor cells show an extreme degree of anaplasia and have little or no resemblance to thyroid epithelium. They are most frequently small and spheroidal or polyhedral in shape and contain very little stroma. They may present variations in the histological appearances; the cells may be relatively large, may be spindle-shaped, and suggest sarcoma.

Munro, D.: The Surgical Treatment of Certain Repeated Explosive Attacks of Vertigo Occurring in the Absence of Any Demonstrable Etiology. *New England J Med*, 1937, 216 539

Repeated explosive attacks of vertigo associated with unilateral deafness and tinnitus, and occurring in the absence of any demonstrable etiology, are known as Ménière's disease. All other forms of vertigo in which pathology is demonstrated are known as aural vertigo. The most common causes of aural vertigo are otosclerosis, chronic suppurative of the middle ear, acute suppurative or exacerbation of the chronic suppurative, secondary sclerosis, and healed suppurative. Attacks of Ménière's disease can now be prevented permanently in practically every instance by division of either the vestibular portion or the entire eighth cranial nerve at the internal auditory meatus.

The etiology of Ménière's disease is unknown. Many suggestions, some of which are bizarre, have been brought up during the past few years. However, it is recognized that such well-known pathological entities as tumors of the pons and cerebello-pontine angle, arachnoiditis, syphilitic meningitis, aneurysm of the basilar artery, and pressure of the eighth nerve by normal or abnormal vessels may, at times, produce attacks which will simulate closely those seen in true aural vertigo.

Numerous forms of treatment have been advised for the treatment of vertigo. These include the use of adrenalin, atropine, luminal, pilocarpine, amylnitrite, acetylcholine, diathermy, ionization, and radiation. Surgical decompression of the posterior fossa with or without opening of the dura, lumbar puncture, puncture of the lateral cistern, puncture of the saccus endolymphaticus, decompression of the internal ear, destructive labyrinthectomy, and section of the entire eighth nerve have been advocated. In addition, injection of alcohol into the canals and destruction of the labyrinth by electrical coagulation have been performed.

Among the medical methods for the treatment of this condition, Furstenberg's low sodium diet has apparently been the most successful. This treatment consists of a low sodium diet with administration of large amounts of ammonium chloride in order to set up an acidosis. This method should be tried in every case before any other methods are instituted.

Of all the surgical procedures advised, probably the only one that is applicable is section of the whole or part of the eighth nerve in the posterior fossa as was done by the late Frazier, and recently popularized by Dandy. By this method the disease is curable in nearly 100 per cent of the cases. According to the author, there are now on record a number of cases which were treated by this method. Dandy alone has already performed 170 such operations.

The operative technique, post-operative complications, and post-operative care are fully discussed.

DAVID J. IMPASTATO, M.D.

Brown, M. R.: The Medical Treatment of Ménière's Syndrome. *J. Am. M. Ass.*, 1937, 108 1158

The original article written by Ménière in 1861 contained the description of an autopsy from which he drew the conclusion that the syndrome was the result of hemorrhage into the labyrinth. It is now realized that the cause is unknown. Of the many treatments recommended, the most successful has been section of the vestibular portion of the eighth nerve.

In 1931 Dederding reported the successful medical treatment of Ménière's syndrome by dehydration and a low salt diet. In 1934 Furstenberg reported that the precipitating factor was sodium, and that its replacement by ammonium chloride prevented the storage of sodium in the body. All of the patients were hospitalized for thirty days or more.

Six patients from the outpatient department of the Boston City Hospital and six from that of the Massachusetts General Hospital were placed on a low sodium diet with the addition of ammonium chloride, and obtained complete relief from severe attacks for periods ranging from six to twenty-two months.

Many unsuccessful attempts at medical treatment have been the result of faulty diagnosis. The symptoms of deafness and tinnitus, at least before an attack, are as much a part of the syndrome as are the vertigo and vomiting and must be present before a diagnosis can be made. The Bárány test is not of great assistance in diagnosis, as many of the patients gave normal reactions. Because of the nausea and vomiting many of the patients were taking sodium bicarbonate or alkaline effervescent, a source of sodium which had to be eliminated before the medical treatment was successful.

Ammonium chloride was used in a dose of 3 gm. (6 capsules of 0.5 gm.) with each meal for three days, then omitted for two days. This dose has been used without ill effects in patients with nephritis over periods of five years. The diet used is given in detail.

EDWARD S. PLATT, M.D.

Rutherford, R.: Auditory Nerve Section in Ménière's Disease. *Brit. M. J.*, 1937, 1 660

An investigation was made to determine the possibility of estimating accurately the depth of the internal auditory meatus from the outer table of the skull. Morant found that an accurate estimate of the depth of the internal meatus could be made by using as a basis of calculation the distance between the asterion and the auricle. The length of the asterion-auricle chord measured in millimeters is multiplied by 0.581, and 26.33 is added to the result. Dr. Morant has compiled complete tables, so that calculation is unnecessary.

The normal lateral sinus runs horizontally outward from the torcular Herophylli, and takes a sharp turn downward at the mastoid process. The trephine hole is made in this angle, thereby allowing a straight approach to the internal auditory meatus, which lies on the posterior surface of the temporal

SURGERY OF THE NERVOUS SYSTEM

BRAIN AND ITS COVERINGS CRANIAL NERVES

Gollub H The Problem of Brain Disturbances Following Ligation of the Common Carotid Artery (*Das Problem der Hirnstörungen nach Unterbindung der Arteria carotis communis*) *München med Wchschr* 1936 2 1827

For the specialist there are numerous indications for ligation of the common carotid artery. Peritonsillar abscesses may rupture into the internal carotid artery after which the eroded wall of the vessel may rupture from the pressure exerted by the blood stream. Ear suppurations may damage the carotid vessels. Injuries due to gun shot often demand ligation.

Ligations may cause instantaneous death or after a certain interval they may produce reparable or irreparable brain injuries. Bier has denied that the brain possesses the faculty of developing a sufficient collateral circulation. According to the author the investigations of Walker are of practical importance. Walker states that in mesocephalic and weak brachycephalic individuals there is a closed circle of Willis with communicating arteries whereas in dolichocephalic persons one or the other of the communicating arteries is missing and the circle of Willis is open. Furthermore the relative size of the internal jugular vein and of the carotid artery is important when the vein is large ligation should not be performed. According to Bruening there are three possibilities:

1. When the collateral circulation is insufficient dilatation with an unfavorable prognosis occurs from anemia.

2. Thrombosis or embolism may occur with cerebral softening after a free interval the prognosis in these cases is also unfavorable.

3. Venous stasis with edema may occur. In these cases there is a free interval followed by hemiplegia. Healing may occur.

The author presents four personal cases with complete histories. In the first case no disturbances occurred even though the man was old. The second and third cases were those of two girls one eight and the other ten years of age. After a free interval they presented hemiplegia but it gradually cleared up completely. In the fourth case the patient forty six years of age died of cerebral softening after hemiplegia which occurred following a free interval. In addition there was a small thrombus present proximal to the ligation. The case histories show how difficult it is to stop the bleeding in such cases. In one case not only the common carotid but also the external carotid and all of its branches were ligated. The author discusses Perthes method which consists of gradually throttling the vessel with a fascial strip.

(FRANZ) LEO A JUBINKE MD

Loehr W. Arteriography of Brain Vessel Injuries II. Thrombotic Obstruction and Tearing of Cerebral Vessels (*Hirngefässverletzungen in arteriographischer Darstellung*) II. Mitt. Thrombotische Verstopfungen und Zerreissungen von Gefässen des Gehirns. *Zentralbl f Chir* 1936 p 2593

In the first part of his studies Loehr pointed out the usefulness of arteriography for the determination of intracranial hemorrhage and in this part he discusses several examples of thrombotic obstruction and vascular injuries.

In one case there was an injury of the left internal carotid artery due to a basal skull fracture with subsequent thrombosis of the vessels. In the second case there was an injury of the anterior cerebral artery. In another instance there was a patient with a tear of the left internal carotid artery and arteriovenous aneurysm in whom gradual closure and cure resulted after ligation of the carotid with fascial strips. Finally a luetic aneurysm was illustrated and the associated clinical history was reported.

In his conclusion the author expresses the opinion that arteriography is justified in the most severe types of brain injury especially when the neurological findings are not definite.

(KESSEL) JACOB E KLEIN MD

Bunnell S. Surgical Repair of the Facial Nerve. *Arch Otolaryngol* 1931 25 235

The author discusses the diagnostic symptoms which indicate the level of injury to the facial nerve and their many causes. Although decompression of the nerve is invaluable in cases in which infection or cold may be the cause of damage this operation is not indicated routinely since 80 per cent of the patients recover spontaneously. Surgical repair is definitely indicated if no signs of recovery are present in six months.

A short summary of the various methods of facial nerve repair and graft is presented. The author describes in detail his operative procedure with emphasis on the advisability of directly uniting the severed nerve ends by means of rerouting the nerve. He presents his method of gaining 16 mm of nerve by rerouting if the lesion is at the bend, or genu or 23 mm if at the geniculate ganglion. If the gap is too great to overcome by rerouting a free graft from the sural nerve in back of the calf is taken. The nerve ends are sutured together accurately with four stitches of fine silk using the shortest curved eye needles. The author emphasizes that the results vary in direct proportion to the accuracy of the union of the nerve ends in the absence of infection plus free blood or open drainage.

Eight cases are presented in detail including one with plastic reconstruction for patients with an irreparable facial nerve.

ROBERT ZOLLINGER MD

SURGERY OF THE THORAX

CHEST WALL AND BREAST

Franzas, F.: *Mastopathia Cystica Latenta and Other Changes in the Clinically Symptomless Female Breast* (Ueber die Mastopathia cystica latenta und andere bemerkenswerte Veraenderungen in klinisch symptomfreien weiblichen brusten) *Arch a d path Inst Helsingfors*, 1936, 9 401

The author carried out extensive studies of the breast on 100 cadavers to find the early stages of mammary gland fibrosis. The breasts were removed, cut into quadrants, and studied histologically. He terms the early stages of the condition mastopathia cystica latenta. The material was divided into the following groups: (1) specimens which showed no microscopic changes (14 cases), (2) with dilatation of the efferent ducts (15 cases), (3) with dilatation of the efferent ducts plus a hyperplasia of the membrana propria (11 cases), (4) with ductal dilatation and epithelial proliferation or possibly only with hyperplasia of the membrana propria (4 cases), (5) with more or less developed cysts in the presence of ductal ectasia and hyperplasia of the membrana propria (12 cases), (6) with cystic changes and epithelial proliferation as well as ductal ectasia and thickening of the membrana propria, (7) with papillary proliferation and cysts, and (8) with cysts associated with a carcinoma (3 cases) and with a papilloma (1 case).

Women who have not fed their children by the breast present more cysts than women who have; the more children, the fewer the cysts. Women who suffer from pelvic disease have more cysts because they usually have fewer children. Just as in hypertrophy of the prostate there is a marked tendency toward growth which first comes into play when the gland undergoes retrogressive changes. Inflammation is not considered the cause. Any infiltration of lymphocytes is interpreted as an absorption process. Carcinoma development in another part of the body does not seem to have any effect on cyst formation; and tuberculosis, only in so far as it produces amenorrhea and involution of the breast gland. The so-called misplaced secretions are not to be looked upon as the cause of cyst formation. All cystic formations originating from the glands with epithelial proliferation or cylindrical epithelium may be classed as cases of mastopathia cystica latenta if retention of the secretion can be excluded.

Cystic changes were seen in 55 per cent of the cases, and were bilateral in 25 per cent. High epithelial cysts were seen in 42 cases, and were bilateral in 15, while low epithelial cysts were seen in 13 cases, and were bilateral in 5. High and low epithelial cysts may co-exist. Epithelial proliferation may occur with or without papillary processes. The connective tissue growth is not greater in the cystic than in the non-cystic breast.

The cause of the cysts is probably the epithelial proliferation in the terminal saccules, which may occur either outwardly or inwardly. If it progresses inwardly there will be papillary formation. By regenerative processes of the efferent ducts new breast tissue develops, similarly to that seen in prostate hypertrophy. In no way can these growths be considered early developmental stages of carcinoma; but just as normal breast tissue, they can be invaded by carcinoma. Carcinoma seems to have a tendency to localize in breasts with cystic areas. Folds in the efferent ductal linings can be explained by changes in the intramammary pressure. The connective tissue of the breast remains in general unchanged until the climacterium when there is an increase in the loose connective tissue. Connective tissue proliferation has its origin in the intralobular tissue. By proliferation of the membrana propria a complete occlusion of the ducts may take place.

(M. BUDDE) WILLIAM C. BECK, M.D.

TRACHEA, LUNGS, AND PLEURA

Frenckner, P., and Bjorkman, S.: *Bronchospirrometry and its Clinical Application, with a Short Account of Bronchial Catheterization.* *Proc. Roy. Soc. Med.*, Lond., 1937, 30: 477.

By "bronchial catheterization" Frenckner means a procedure analogous to ureteral catheterization which is applied to the bronchi. It involves the introduction of gaseous substances into, or their withdrawal from, any given portion of the lung by means of a flexible or rigid tubular instrument. This instrument is equipped with an air-tight device between its terminal end and the bronchial wall, which forces the gases to pass back and forth through only the instrument without leakage. This obturator was devised by Frenckner, and can be attached to the distal end of a bronchoscope. When conveyed into proper position it produces an air-tight closure, which has previously not been possible.

The obturator consists of a short cylindrical metal tube connected with a very small rubber tube; the latter runs the length of the bronchoscope and permits inflation of a special rubber sleeve fastened over the obturator by means of two tightly fitting rings (See Figures 1, 2, and 3).

By the term "bronchospirrometry" Frenckner means bronchoscopic spirometry, a determination of the amount and gas analysis of the respiratory air in each lung by means of bronchial catheterization. He uses a double bronchoscope of special construction which keeps the respiratory air of each lung separate.

Bjorkman discusses the clinical results of bronchospirrometry. Ten normal persons, the majority of which were medical students, were first examined. It was proved that the right lung has a greater share

bone near its apex. In adults its center lies 5 mm below the attached border of the tentorium cerebelli. Through it are transmitted the facial nerve, the pars intermedia, and the auditory nerve in the order named from above downward. There is a safe distance of 10 mm between the meatus and the brain stem in adults.

One case is reported in which a flat malleable retractor was inserted to a predetermined distance, at which point traction immediately revealed the internal meatus. The auditory nerve was divided by a tenotomy, and the patient was subsequently free from vertigo and nausea. She developed suppurative parotitis ten days later, and succumbed on the fourteenth day.

An operating endoscope has been devised, the use of which is believed to help in the observation of brain surfaces. EDWARD S. PLATT, M.D.

SYMPATHETIC NERVES

Leriche R. and Fontaine R. *Remarks on 1199 Operations on the Sympathetic Nervous System* (Einige Bemerkungen ueber 1199 Operationen am Sympathicus). *Arch f Klin Chir* 1936 186 55 338

Leriche and Fontaine discuss the present status of surgery of the sympathetic system on the basis of 1199 operative procedures. The surgeon may adapt his operative intervention to the severity of the disease process. The 1199 interventions included 261 cervical sympathectomies, 178 lumbar sympathectomies, 7 splanchnic resections, and 6 resections of the aorticorenal ganglion. The superior mesenteric plexus was often divided. In 50 cases the hypogastric plexus was divided, and in 9 the dorsal chain was divided by a posterior approach for painful amputation stumps in 7 and for tabetic crises in 2. In addition to 511 operations on the gangliated cord and its branches, the authors report 511 peripheral sympathectomies.

In 261 cervical sympathectomies there was one death. In 178 lumbar sympathectomies there were 6 deaths (3.3 per cent). The results are classified

under the diseases of the extremities and diseases of the internal organs. Cervical sympathectomy was successful in two cases of vascular brain disease. Stellate ganglionectomy was performed without any beneficial effect in 3 cases of pulmonary tuberculosis. Typical facial neuralgia could be cured by resection of the semilunar ganglion. In facial nerve palsy, however, the resection of the upper cervical ganglion was often indicated. Angina pectoris was an excellent field for cervical sympathectomy. The results were best where there were marked spastic disturbances. In these cases the one or two-stage stellate ganglionectomy was the method of choice. Twenty-seven patients with angina pectoris were operated upon with good results in 70 per cent, no fatality, and cures lasting up to ten years.

In asthma Leriche obtained lasting cures in 25 per cent, improvement in another 25 per cent, and failure in 50 per cent. The resection of the hypogastric plexus gave excellent results in dysmenorrhea. In five cases of megacolon there were three good results, one of which was outstanding. They were obtained by resection of the superior mesenteric plexus and bilateral resection of the lumbar chain. The results in painful amputation stumps were in constant. Five cases with chronic acicula were improved by lumbar sympathectomy. In Raynaud's disease as in scleroderma, the results were invariably good. Only far advanced cases were unimproved by the operation. In scleroderma the operation of choice is a combined sympathectomy and parathyroidectomy. Traumatic edema disappears readily and permanently after peripheral sympathectomy.

In cases of acute Sudeck bone dystrophy Leriche obtained surprisingly beneficial results. In cases of tabetic joint disturbances failures occurred. In varicose ulcerations the results were good. Permanent cures were obtained in hyperhidrosis. In endarteritis obliterans resection of the lumbar chain was carried out, while in arteriosclerosis arterial resection was usually carried out. In endarteritis obliterans good results were obtained from sympathectomy in 58.8 per cent of the cases.

(RIEDER) WM C. BECK, M.D.

Paralysis of the phrenic nerve as an independent procedure appeared to have little or no effect in 20 cases of basal bronchiectasis

Most lobectomies are considered elective operations and are not performed during the winter and early spring. It is believed that the exacerbation of the disease and the high incidence of respiratory infections during this period might increase the risk of operation

RICHARD H. OVERHOLT, M.D.

Laurell, H.. The Disposition of the Upper Portions of the Lungs toward Tuberculosis; A Study of Tuberculosis (Die Disposition des Lungenobergeschoßes zur Tuberkuloseerkrankung, ein zentrales Problem der Tuberkuloseforschung) *Acta radiol.*, 1936, 18 341

In all human beings some orthostatic displacement of the blood toward the abdomen and lower extremities occurs with impairment of the circulation. This displacement is usually so insignificant that it causes no discomfort. In certain animals, however, the upright position produces such a marked circulatory disturbance that death ensues. In human beings severe types of such a disturbance with extreme reduction of the minute volume also occur. Bjure and the author have applied the term "orthostatic arterial anemia" to all cases showing objective symptoms and specific discomfort as a result of diminution in the minute volume when standing. The borderline between the normal and the pathological conditions is not at all sharp.

It is possible to distinguish a constitutional and a conditional orthostatic arterial anemia. They may occur also in combination.

The conditional type may be compared to Stiller's morbus asthenicus and closely related constitutions.

Both the constitutional and the conditional forms are found in the types of constitution, the age periods, and the normal or pathological conditions which are assumed to predispose to pulmonary tuberculosis, for instance, habitus asthenicus, menstruation, climacterium, the period after childbirth, debilitating diseases, and conditions of hunger.

The asthenic discomfort and symptoms seen in morbus asthenicus and orthostatic arterial anemia are often also exhibited by patients with florid pulmonary tuberculosis, and are incorrectly interpreted as being due to the tuberculosis.

Static displacement of the pulmonary blood takes place in all individuals, but occurs most frequently in persons with pronounced orthostatic arterial anemia, in whom it can be demonstrated roentgenologically.

The author believes that poor circulation in the upper portions of the lungs in the upright position is an important reason why these areas are susceptible to tuberculosis in both young and adult life.

In prophylaxis and therapy these facts must be taken into consideration.

The resistance of the basal portions of the lungs which increases with age is dependent on both non-specific and specific immunity to tuberculosis.

ESOPHAGUS AND MEDIASTINUM

Pilcher, R.: Carcinoma of the Cervical Esophagus. *Lancet*, 1937, 232 73

The author comments on the fact that while cancer of the thoracic esophagus occasionally comes within the reach of exceptional skill, the treatment of this condition is for the most part an unsolved problem. On the other hand, successful treatment of cancer of the cervical esophagus by excision has been practiced for many years.

The author makes some suggestions which he hopes will be of value. He believes earlier diagnosis is important, and not only describes the early and late symptoms of the disease, but recommends special study of the condition by direct examination, or esophagoscopy, and biopsy combined with proper clinical and roentgen-ray examination.

Under the heading of "special features," he points out certain peculiarities of the condition which have not received the attention necessary for a reasonably early diagnosis. One of these peculiarities is the comparative lateness of interference with deglutition, due probably to the great diameter of the gullet and the propulsive power of the pharyngeal muscles immediately above. Other characteristics are involvement of the adjacent structures, such as the recurrent nerve, the thyroid gland, or even the trachea, before dysphagia is noted.

These findings are in contrast to those encountered in cancer of the middle or lower portion of the esophagus, in which as a rule, dysphagia appears before other symptoms. When there is tracheal involvement, irritation precedes perforation, which may be followed by dysphagia for fluids only and, soon thereafter, by pulmonary infection. While glandular metastasis is not marked, metastases to other parts may dominate the picture.

Special methods of examination are required if an early diagnosis is to be established. Early symptoms are trivial and the responsibility of examination rests with the physician first consulted. If persistent weakness of the voice and slight difficulty in swallowing are noted, a roentgenographic study with special films as well as fluoroscopic examination should be made, and if no growth is detected esophagoscopy should be performed.

Surgical excision has been successful in many cases in which the diagnosis was established before the adjacent structures had become involved. Involvement of structures outside of the esophagus does not necessarily render the case inoperable. Excision of the glands and sometimes of the larynx may be required, but is not necessary in all cases. The outlining of generous skin flaps in the first incision is very important because the flaps are used for replacement of the resected portion of the esophagus.

The article includes case reports which describe the findings and results of early and late treatment.

MILLARD F. ARBUCKLE, M.D.

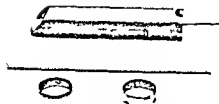


Fig 1 The unassembled parts of the obturator

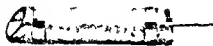


Fig 2 Obturator assembled and ready for introduction by means of the bronchoscope

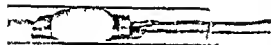


Fig 3 Testing the obturator by inflating it within a glass tube

in the total respiratory function than the left because it is larger anatomically. In cases of pathological processes of the lungs, the thoracic viscera or the pleura, the function of the lungs is more or less restricted on the side harboring the disease.

The most important object of the bronchspirometric examination has become the determination of the function of each lung in cases of bilateral disease in which a unilateral irreversible operation is contemplated.

Another observation of interest made by means of the bronchspirometric method of Bjorkmao is that the function of the lower lung in a person reclining on one side is not impaired. There is an increased intake of oxygen due to the increased blood supply which in turn is due to the law of gravitation.

J DANIEL WILLEMS M D

Richnoff W F Jr. Intrathoracic Anatomical Readjustments Following Complete Ablation of One Lung. *J Thoracic Surg* 1937 6 254.

The author discusses the adjustments made by the remaining lung when the other lung is congenitally absent atrophied or surgically removed. The study is based upon an analysis of two cases each of

the first two conditions and 12 cases in which pneumonectomy was performed. Autopsy studies were made in 7 of the latter group.

The restitutional compensatory mechanism following total or partial removal of the lung is based essentially on three factors: (1) the readjustment and adaptation of the thoracic cage and diaphragm on both sides of the body; (2) the compensatory dilatation of the remaining lung; and (3) the production of a fenestrated labyrinth of connective tissue which tends to fill any dead space. Factors 1 and 2 fail to produce complete obliteration of the remaining thoracic space.

It is believed that patients undergoing pneumonectomy on the left side will be better able to make intrathoracic adjustments than those with pneumonectomy on the right side. Richnoff advocates a multiple stage operation for certain right lung resections. The lung should be mobilized and the pulmonary artery ligated in the first stage and in the second stage the lung should be removed. Experimental or clinical experiences with such an operation are not given.

There is no evidence that compensatory dilatation of the lung is harmful. Thoracoplasty should be delayed as there is only a remote possibility of its being necessary in conjunction with pneumonectomy. RICHARD H OVERHOLT M D

Churchill E D. Lobectomy and Pneumonectomy in Bronchiectasis and Cystic Disease. *J Thoracic Surg* 1937 6 286.

A mortality of 6.1 per cent was recorded in the cases of 49 patients upon whom lobectomy or total pneumonectomy was undertaken for bronchiectasis or cystic disease and a mortality of 5 per cent was recorded for 40 patients upon whom lobectomy alone was done. In the cases of 38 patients subjected to lobectomy by methods now recommended the mortality was 2.6 per cent. The last 30 successive lobectomies including one with the removal of the right middle lobe as well as of the left lower lobe were completed without mortality.

Two surgical programs are available: one stage lobectomy and two-stage lobectomy. Each procedure has its indications. A choice should be made according to the problems presented by the individual patient. The total number of postoperative days in the hospital are approximately the same following the two operations.

If a two-stage lobectomy is chosen, it is strongly recommended that the second stage of the operation should not follow the first too closely. Symptomatic and physical improvement follow the first stage of the operation in the majority of the cases and if some time elapses the patient approaches the more hazardous procedure in an improved condition.

Three cases of cystic disease of the lung are briefly described and contrasted with a case of severe cystic bronchiectasis. A case in which a one-stage total pneumonectomy was done for bronchiectasis is reported briefly.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Bratrud, A. F.: The Ambulant Treatment of Hernia. *Ann Surg*, 1937, 105: 324

During the past five years Bratrud has endeavored to perfect a method of curing certain hernias by the injection of sclerosing solutions. Experimental work consisted of injecting various solutions into the abdominal cavity and the subperitoneal tissue, and below the rectus abdominis fascia of dogs and rabbits. The solutions used included phenol-thuja mixture, Mayer's solution, oleic acid, Pina Mestre solution, tannic-acid solution, and proliferol. All tissues showed an early necrosis before fibroblasts appeared and permeated the muscle fibers. When the solution was injected into the peritoneal cavity, the omentum and loops of bowel became very adherent. Pina Mestre solution produced necrosis so marked as to contra-indicate its clinical use. Aqueous solutions of tannic acid caused so much burning that they required the use of local anesthetics. Symptoms of acute coryza followed the injection. The fibroblastic tissue which results following the injection of phenol-thuja mixture is denser and tougher than that resulting from tannic-acid preparations.

The injection treatment of hernia can be used in patients of all ages, provided that the hernia can be completely reduced and held reduced by a properly fitting truss during the period of active treatment. Umbilical, indirect inguinal, direct inguinal, and recurrent hernias give the best results. The method has limited use or is contra-indicated in the treatment of postoperative hernias, femoral hernias, hernias associated with undescended testicle, sliding hernias, and large scrotal hernias, and in the presence of any general surgical contra-indication, such as hemophilia.

It is absolutely necessary to apply an accurately fitted truss and considerable care should be directed toward this procedure. Injections are begun at the internal ring, and after several have been given the hernia does not come down even when the truss is removed. The injections are continued along the inguinal canal, just inside the external ring, and also upon the conjoined tendon in Hesselbach's triangle. They are made twice a week. As few as four have been sufficient, and in large hernias as many as twenty have been required.

Swelling of the cord has been noted in a few cases but has caused no serious disability. Occasionally anesthesia or hyperesthesia has occurred after treatment, but it disappeared in a few hours. There have been a few cases of abscess with sloughing of tissue but none was extensive. Severe abdominal pain occasionally occurs during the injection of the solution. One patient who was treated elsewhere with 16 minims of phenol-thuja mixture developed general

peritonitis and died at the University Hospital, Minneapolis.

The principal advantage of the injection treatment of hernia is that it is ambulatory. The economic issue is also of great importance. By early use of injection treatment in hernia recurring after surgical repair, subsequent repair can be avoided. The procedure has the disadvantage of requiring a long period of time and the wearing of a truss. There will be an occasional case which cannot be treated successfully by injection, but the injections do not form a contra-indication to surgery later.

EARL GARSIDE, M.D.

Rice, C. O.: The Injection Treatment of Hernia. *Ann Surg*, 1937, 105: 343

The injection treatment of hernia is based on the principle of closing the hernial defect and occluding the hernial sac. The method of accomplishing this must be relatively safe and insure satisfactory end-results.

The two types of sclerosing substances employed for injection are acid or caustic salt solutions and mild soap solutions. The latter are used by the Hernia Clinic at the Minneapolis General Hospital.

An important factor affecting the end-results is the proper selection of cases. A primary consideration is that the hernia must be reducible and capable of being retained by a properly fitting truss. Cases with an external inguinal ring exceeding 3 cm in diameter are difficult to cure by injection. Excessive obesity, chronic cough, and certain systemic diseases, as syphilis, diabetes, and hemophilia, are contra-indications to injection treatment.

At the Minneapolis General Hospital cures have been obtained in 445 hernias. Failure occurred in 11 cases. There were no deaths. Seventy-eight of the cured cases developed complications. The complications were: induration of the cord in 44 cases, superficial ulceration of the skin in 8, severe pain in 10, chemical peritonitis in 2, hydrocele of the cord in 7, local abscess in 2, and dermatitis in 1 case.

EARL GARSIDE, M.D.

McKinney, F. S.: An Evaluation of the Results of the Injection Treatment of Inguinal Hernia. *Ann Surg*, 1937, 105: 338

An analysis is made of the methods and results obtained by the injection treatment of hernias in 554 patients admitted to the University of Minnesota Hernia Clinic. At least six months had elapsed since the last injection in all cases, and from one to three and one-half years in most cases. Cured cases are defined as those in which there is no evidence of viscera or any abnormal bulging in the inguinal canal. A large number of injections are required for cure. Eighty-three per cent of the patients were cured. Patients with indirect inguinal hernias who were

MISCELLANEOUS

Nierstrasz J J Wounds and Tears of the Diaphragm (*Zwerchfellverwundungen und zerrissenungen*) *Beitr z klin Chir* 1936 164 337

Paré mentioned a case of gunshot wound of the sternum in which death resulted at the end of eight months from strangulation of the large intestine in a hole in the diaphragm. According to Iselin the belief that radial tears can heal is incorrect as the omentum is sucked up and incarcerated in the pleural space and gradually draws the other organs with it. As the pylorus and cardia are fixed the stomach with its greater curvature undergoes torsion to as much as 180 degrees when it enters the thoracic cavity. This favors the formation of ulcers which may perforate into the pulmonary arteries. The kinking results in difficulty in swallowing, nausea, dyspnea, even sudden suffocation after meals and displacement of the heart. As a rule strangulation of the large intestine occurs. Without operation the mortality is 75 per cent. With operation 15 per cent. Iselin found that most deaths are due to respiratory difficulties or strangulation.

Of 83 patients treated conservatively 72 died within a few years. Puncture and gunshot wounds of the diaphragm are seldom recognized promptly. Enderlein therefore demands exploratory section within twelve hours in every case of thoracic injury below the fourth intercostal space. A search should be made also for injury of the spleen and liver.

Tears of the diaphragm without external wounds are caused usually by compression of the thorax in traffic accidents. If no abdominal organs are injured there is usually no reflex muscular defense. A typical symptom is pain on respiration.

Before the war several hundred tears of the diaphragm were demonstrated by Lacher and Rochard. The diagnosis was usually not made at first. Only a few were operated upon successfully immediately after the accident.

The author reviews 7 cases from the literature. In discussing the type of operation he states that there is still a difference of opinion as to whether a

thoracic or an abdominal approach should be used. He says that with regard to this problem it is best to keep an open mind. When there is an external wound its site will usually answer the question. If there is strangulation the thoracic approach should be employed. Moreover it should be borne in mind that proper treatment of wounds of the diaphragm is often impossible by the abdominal approach. The dome may be reached by Marwedel's incision along the costal arch or Charbonnet's paramedian incision followed by division of the sixth and seventh costal cartilages and if necessary opening of the pleural cavity. If the thoracic approach is used the anterolateral incision in the seventh intercostal space is indicated. In some cases crushing or section of the phrenic nerve is necessary. This causes relaxation of the diaphragm and makes its approach from the abdominal cavity more difficult.

The position of the patient during the operation is important. When he lies on his right side with the left arm raised, the left dome of the diaphragm sinks. For cases of large wounds in the diaphragm Rehn advises bringing the medial margin up to the chest wall and fastening it there with pericostal and percutaneous sutures.

The author reports in detail 10 cases of wounds of the diaphragm. Two patients with gunshot wounds and complicating injury of the intestine were operated upon by the abdominal route and died. Four patients with stab wounds of the thorax—3 of whom had a complicating wound of the liver and 1 an injury of the transverse colon—were cured by an operation performed by the thoracic route. Two patients with tearing of the diaphragm by a blunt force who were not operated upon developed respiratory difficulty and died within a few minutes, one of them seven days and the other a few hours after the injury. At autopsy it was found that the stomach greatly distended and filled with fluid and gas had completely collapsed the left lung and displaced the heart to the right. In 2 cases of diaphragmatic tear an intercostal operation was performed with successful results. The author presents 3 roentgenograms.

(FRANZ) FLORENCE A. CARPENTER

peritoneal reaction. He found that dogs and rabbits show a different response to the same stimulus. In the rabbits, plastic and exudative peritoneal reactions predominated, whereas, in the dogs, omental adhesions tending to surround the foreign body were most frequent. In both animals the author observed an increased production of mucin which he considers to be an additional factor in the peritoneal defense mechanism.

On the basis of his experiences Bassi concludes that only tubular drains should be used. Gauze drains are indicated only in cases in which the formation of adhesions is desired.

RICHARD E. SOMMA, M.D.

GASTRO-INTESTINAL TRACT

Kajiser, R.: Hemangioma of the Gastro-Intestinal Tract (Ueber Haemangiome des Tractus gastro-intestinales). *Arch f klin Chir*, 1936, 187: 351.

This article gives an excellent résumé of the observations and reports on hemangioma of the gastro-intestinal canal in the medical literature. In addition to about sixty cases of this nature in the literature, the author adds two from his own personal material.

The first case was that of a girl nineteen years of age who appeared to have been badly afflicted with hereditary tuberculosis and disclosed in addition to a number of congenital hemangiomas of the skin and buccal mucosa, a large cavernous hemangioma of the stomach near the lesser curvature. Radical attack on the gastric mass could not be attempted because of its extent and therefore it was treated by roentgen irradiation. The bleeding into the gastro-intestinal tract became less and the severe anemia improved.

In the second case there was a cavernous hemangioma showing a roentgen shadow defect in the sigmoid colon of a boy eight years of age. In this case the affected section of the intestine could be removed. The bleeding into the intestine stopped and a cure followed.

In both cases, in addition to the bleeding into the intestinal tract, there was a deposition of calcium in the cavernous spaces, phleboliths, which was roentgenologically demonstrable. These phleboliths are often found in the small pelvis, but practically never in the other regions of the abdominal cavity.

The treatment of such growths is purely surgical. When, as is frequently the case, surgical removal is impossible because the tumor does not present clear cut edges and the vascular dilatations extend widely, the outlook for the patient is quite grave, as a rule.

Kajiser divides the hemangiomas reported in the literature into

1 Multiple phlebectasias. These are not infrequent and are always to be regarded as of congenital origin as well as the tumors which are in the following groups.

2 Cavernous hemangioma occurring in two different forms. The one form is found in the wall of the intestine, in which cases the intestine is in-

vaded by the growth to a certain extent and the walls are partly replaced by tumor tissue. In these cases well-marked delineation of the borders of the mass is absent. In the other form there is a sharply delimited, frequently polypoid, tumor. The latter form is often found in the colon. All these growths with their widely dilated venous loops frequently contain phleboliths and may often be recognized roentgenologically by the latter.

3 Simple hemangioma or capillary hemangioma. These consist of a network of more or less dilated capillaries and in addition, of cells originating from the endothelium of the capillaries. They may become cell-rich tumors and form the transition to the hemangio-endotheliomas. They may grow to become large tumors, protruding into the stomach and the lumen of the small or large intestine.

4 Angiomatosis. This condition appears under different forms, one of which is the Rendu-Osler disease, telangiectasia hemorrhagica hereditaria. The condition shows the most variable characteristics, hyperplasia and exuberant development of the endothelium of the involved vessels play a definite rôle. Frequently the microscopic picture of the tumor suggests malignancy such as a true angiosarcoma, but it is always benign. As a rule this type of tumor of the intestine is accompanied by hemangiomas and warty growths of various sorts on the superficial cutaneous surfaces of the body. Frequently growths of this character appear in crops. Often they are tiny blueish-red nodules without pathological significance.

(RUGE) JOHN W. BRENNAN, M.D.

Myles, R. B.: Anatomical Variations of the Stomach and Duodenum Within the Abdominal Cavity. *Brit J Radiol*, 1937, 10: 237.

Myles states that in the text books of radiology there is little classified material concerning the anatomical variations of the stomach. There are variations of the stomach in the abdomen which are acquired, in that they are the direct result of extrinsic abnormalities or lesions rather than developmental anomalies of the viscus itself. The "J" shaped stomach may be said to be normal in the average subject, the transverse stomach is seen in the patient of stocky build, while the long hyposthenic stomach is entirely normal in the long thin individual.

As regards variations in size, the writer recognizes the abnormally small type of stomach, but such stomachs appear to do their work very well. A considerable amount of published material has appeared on enlargement of the stomach. Under the title of gastromegaly, Miller and Gage reported several cases of children with markedly enlarged stomachs, hypertrophy of the muscular coats, and marked gastric stasis. The condition was the result of obstruction, not in the stomach but resultant from chronic duodenal ileus. In adults with large stomachs megaduodenum occurs when obstruction takes place at the ligament of Treitz in the third por-

cured received twice as many injections as those who were not. Direct hernias required more injections than the indirect. The failures were greatest in the old patients.

No injection was made until it had been demonstrated that a truss would hold the reduced hernia under any physical strain. A fitted oversized spring truss was used. A correct pad was just as important as the truss. Obese patients require a larger, thicker pad.

The results varied according to the age groups. Of fifteen children under thirteen years of age only two had recurrences after six injections. The psychic element was a disagreeable factor in the injection treatment of children. In the obese and in long-standing hernias the results were poor.

Injection treatment of small epigastric and umbilical hernias was successful. Success in femoral hernia depended upon the complete reduction by truss and very careful injection in order to avoid the femoral vessels.

The commonest complication was swelling of the spermatic cord. Other complications included strangulation, slough following injection of the deep epigastric artery, local peritonitis, swelling of the scrotum, thrombosis of the anterior tibial artery and abscess of the spermatic cord. There was no mortality and no testicular atrophy.

Disadvantages of the injection method include the prolonged treatment, the uncertainty as to the number of injections necessary, and the inability of patients to keep the hernia reduced by the truss. The patient is apt to diagnose the hernia as cured as soon as the swelling disappears. Frequent examinations are necessary before a cure can be pronounced.

The advantages of the treatment are that it permits the continuation of regular occupation on the part of the patient; it does not cause serious complications; it may be used when surgery is contra-indicated; it makes a second operation unnecessary in recurrent hernias; and it may be used for aged patients.

In conclusion McKinney emphasizes the importance of a properly fitting truss and urges that injection therapy be added to the physician's armamentarium instead of being condemned as quackery. The small hernia in a young patient is the ideal condition for this type of treatment.

EARL GARSIDE, M.D.

Cole W. H. Pneumococcus Peritonitis. *Surgery* 19:7 1 386

A study of the 26 cases of pneumococcus peritonitis occurring in the St. Louis Children's Hospital during the past eighteen years has led to certain deductions. In this series it appears that development of peritonitis secondary to infections such as those of the upper respiratory tract is more common than any other type of development. The differentiation of the condition from acute appendicitis can usually be made by noting such features as the early de-

velopment of fever, profuse vomiting, diffuse tenderness and pain and prevalence in girls. Diagnostic puncture of the abdomen is justifiable in children when the diagnosis is uncertain and rarely fails in establishing a correct diagnosis if the peritonitis is of pneumococcal origin. Immediate operation appears to be contra-indicated. More favorable results are obtained when operation is delayed until a localized abscess forms.

If the child survives the acute stage of the disease recovery is almost certain, even though one or more localized abscesses form; however, such abscesses must be drained properly.

Pneumococcus peritonitis is a common complication of nephrosis. The mortality in children with the latter condition is higher than in previously healthy children. SAMUEL KAHN, M.D.

Bassi P. Experimental Research on the Duration of Function of Peritoneal Drains. (*Ricerche sperimentali sulla durata di funzionamento dei drenaggi peritoneali*) *Ann. ital. di chir.* 1936 13 683

After reviewing the literature on the defense mechanism of the peritoneum in general, Bassi reports the results obtained in a series of experiments in which he attempted to study (1) the duration of function of a drain placed in the abdominal cavity, (2) the type of drain to be used to obtain maximum function, and (3) the peritoneal reaction and response to various types of drains.

For the study of the first problem he used a series of dogs which he laparotomized. Three types of drains were introduced into the abdominal cavity: (1) a rubber sound (Nelaton No. 20), (2) a rubber tube with lateral windows, and (3) a layer of non-medicated sterile gauze. With the animal lying on its back and placed in a semi-horizontal position, various dyes such as methylene blue and Congo red were injected intraperitoneally at various time intervals. All of the animals were given suitable doses of morphine to keep them quiet. At regular time intervals observations concerning the functional activity of each drain were made.

In discussing the results the author states that a gauze drain establishes drainage rapidly—within the first hour. The gauze absorbs quickly all fluids with which it comes into contact. However, its function ceases completely after ten hours since at the end of that time the gauze is thoroughly impregnated; the fibrin forms a solid clot, and the entire material is converted into a non-absorbent homogeneous mass.

Drainage produced with a tube is established later, i.e., about ten hours after the initial injection, but is more lasting. The author has observed the color of the indicator in the drained fluid as late as seventy hours after the time of the first injection.

For study of the third problem Bassi used a series of rabbits and dogs. He introduced various types of drains into the abdominal cavity, killed the animals after certain time intervals, and then studied the

elsewhere, but three had had pleurisy. In the negative group, one had active pulmonary tuberculosis and one gave a history of pleurisy.

Clinically, there were no characteristics definitely distinguishing the tuberculous from the non-tuberculous fistulas. A chronic onset was rather more common in the tuberculous cases, and they all showed a large amount of pathological tissue. All the fistulas, tuberculous and non-tuberculous, healed promptly and permanently.

Uggen concludes that the only reliable criterion of the tuberculous nature of an anorectal fistula is a positive bacteriological result either from culture or animal inoculation of the tissue. A preceding or active tuberculosis in cases of anorectal fissure in general is rather unusual. The incidence of 20 per cent demonstrated in this study is probably higher than would be found in an entirely unselected series. As the tuberculous nature of the fistula was proved in three patients who had neither active nor inactive tuberculosis elsewhere, it appears that perianal tuberculosis may be primary in the usual sense of the word.

The article is accompanied by tables, photomicrographs and a bibliography. M. E. MORSE, M.D.

LIVER, GALL BLADDER, PANCREAS, AND SPLEEN

Andrews, E., Harkins, H. N., Harmon, P. H., and Hudson, J.: Shock Syndrome Following the Subcutaneous Injection of Bile or Bile Salts. *Ann. Surg.*, 1937, 105: 392.

In experiments carried out on 11 animals the authors found that the subcutaneous injection of bile or bile salts was followed by a local exudation into the tissues of plasma-like fluid averaging 3.8 per cent of the body weight, concentration of the blood, a fall in the blood pressure, and death nineteen hours after the injection.

They conclude that the exudation of fluid is sufficient in quantity to be a lethal factor of importance. They believe also that the parallelism of action of bile or bile salts when injected subcutaneously and intraperitoneally in the production of a shock-like syndrome affords reciprocal evidence of secondary surgical shock as a lethal factor in the two conditions. ROBERT ZOLLINGER, M.D.

Borman, C. N., and Rigler, L. G.: Spontaneous Internal Biliary Fistula and Gall-Stone Obstruction. *Surgery*, 1937, 1: 349.

Spontaneous internal biliary fistula is more common than autopsy or operative records indicate. The diagnosis can readily be made by roentgen examination alone and often the exact anatomical site of the fistula can be found. The presence of gas or barium in the biliary system, the demonstration of the barium-filled fistula itself, the absence of a normal gall-bladder shadow in cholecystography, and the presence of mucous-membrane changes in the gastro-intestinal tract are the chief roentgenological

findings. Gall-stone obstruction is a complication of internal biliary fistula which should always be considered in atypical cases of intestinal obstruction. It is diagnosed clinically with great difficulty. In cases of suspected intestinal obstruction, roentgen examination of the whole abdomen, but of the gall-bladder region particularly, may reveal evidence of a biliary fistula and thus make the origin of the obstruction clear. This type of examination should be made in all cases with symptoms of obstruction of obscure origin.

The authors have reviewed the general findings in spontaneous internal biliary fistula and the literature has been brought up to date. The incidence, pathology, and clinical findings are discussed. To the previously reported cases observed at autopsy, twenty-four have been added. The authors collected 83 roentgenologically diagnosed cases from the literature and added 8 new cases. The roentgen findings and a report of two cases diagnosed roentgenologically are given in detail.

HARRY W. FINE, M.D.

Moore, S. W.: Intramural Formation of Gall Stones. *Arch. Surg.*, 1937, 34: 410.

Stones within the wall of the gall bladder were first described by Morgagni and later by Rokitsky, who found them in small outpouchings in the mucous membrane of the wall. These sinuses were first studied and described in full by Aschoff. They are known as Rokitsky-Aschoff sinuses. Aschoff also called attention to stones in the sinuses and the marked infection which may surround them, and to the abscess formation and perforation which may occur.

He advanced the theory that the sinuses are the result of the increased pressure and the stones within an infected gall bladder. Many observers since Aschoff have reported these sinuses, but for the most part they have failed to associate their presence with stones in the gall bladder. Some have even considered them as the cause of the cholelithiasis. The sinuses have also been believed to be factors in the development of diverticula, and their multiplication under the muscularis is defined as "cholecystitis glandularis proliferans."

A report is made on 300 gall bladders removed at operation and studied. Of this number 231 (77 per cent) contained stones, and 101 (30 per cent) presented Rokitsky-Aschoff sinuses. Of the 101 gall bladders in which sinuses were found, 98 (97 per cent) contained stones.

Two cases are described in which the gall bladder had perforated. In both of these, Rokitsky-Aschoff sinuses were present and were believed to have played a part in the perforation. One case is reported in which there was a formation of stones inside of the sinuses, deep beneath the muscularis of the gall bladder.

The article is illustrated by a number of photomicrographs.

J. THORNWELL WITHEPSPOON, M.D.

tion of the duodenum. These cases of giant stomach are acquired lesions caused by obstruction.

The majority of alterations in the position and shape of the stomach are due to compression of the stomach by adjacent organs and the deformity varies with the degree of compression and with the compressing agent. The stomach may be deviated to the left by tumors of the liver, pancreas, and right kidney. Deviations to the right result most frequently from abnormalities of the spleen or left kidney. Upward displacement is caused by tumors of the pelvis and lower abdomen by ascites and by pressure from the transverse colon and jejunum. Adhesions may displace the stomach in any direction and to varying extents.

The normal colon may cause notching of the greater curvature of the stomach in various degrees. The line of encroachment is clear cut by virtue of the gas content of the colon. The condition may be diagnosed from an organic fission or spasm of the stomach by the fact that it varies from time to time as the amount of gas varies in the colon.

VOLVULUS OF THE STOMACH

With volvulus of the stomach on the longitudinal axis the greater curvature displaced by the colon goes up in front of the lesser curvature and curves around so that the upper line of the stomach is the greater curvature and the lower line the lesser. The posterior surface becomes anterior and vice versa. The upper point of torsion is at the level of the pedicle of the spleen and the lower point may be in front of the pylorus. The degree of volvulus varies as the amount of gas in the colon varies from day to day. In volvulus on the transverse axis the stomach is folded so that the normal lower half is placed in front of the cardiac segment and the pyloric antrum is situated under the left diaphragm in front of the gas bubble. The pyloric segment then sweeps down toward the duodenum on the left side of the spinal column. Two gas bubbles are therefore present in the majority of the cases.

DIVERTICULA OF THE STOMACH

The diagnosis of diverticula of the stomach rests upon radiological examination. The condition is probably more common than surmised. Up to 1935 141 cases were recorded. Diverticula of the stomach give no characteristic clinical symptoms but in the majority of the cases the symptoms suggest gastric or duodenal ulcer. The writer suggests the following simple classification of diverticula of the stomach (1) congenital when all the coats of the stomach wall are present in the diverticulum and (2) acquired when the muscular coat is absent.

Acquired diverticula may be pulled on diverticula resulting from herniation of the mucus and submucous layers of the stomach by pressure from within or traction diverticula the result of perigastric adhesions. A true diverticulum appears like a sac communicating with the stomach and containing an air bubble and, if opaque food has been given a fluid

level and it is joined to the stomach by some sort of pedicle long or short wide or narrow. In practically all cases the diverticulum retains some of the opaque food after the stomach itself has emptied and can then be clearly demonstrated.

JOHN W. NOZUM, M.D.

Rowe E. W. and Neely J. M. Primary Malignancy of the Small Intestine. *Radiology* 1937 23 325

Röntgen ray examination of the jejunum and ileum had not been sufficiently perfected in the past to permit recognition of tumors. A review of the literature shows that tumors of the small intestine are not so rare that they can be disregarded. In 1904 Bull found 89 such tumors in 3563 cases of malignant tumors of the intestinal canal an incidence of 2.5 per cent. In 1932 Raiford reported 83 cases of tumors of the small intestine in a review of the records of 11,500 autopsies and 45,000 surgical specimens from Johns Hopkins Hospital. The same author found 339 tumors of the small intestine in a review of the literature. Others have reported a series of cases.

Netter of the Mayo clinic stated in 1936 that carcinoma of the large bowel is eighty times as frequent as carcinoma of the small intestine. He found carcinoma of the small intestine most frequently in the jejunum. Exceedingly few of these carcinomas were found on roentgen examination, but more careful study of the normal appearance of the small intestine will lead the way to the future success of the roentgen diagnosis.

The authors report eight cases of tumors of the small intestine five of adenocarcinoma of the jejunum one of colloid carcinoma of the duodenum with possible origin in the pylorus two of lymphoblastoma one presenting multiple tumors with the histological appearance of Hodgkin's disease, the other presenting a lymphosarcoma.

MANUEL E. LICHTENSTEIN, M.D.

Uggeri G. The Etiology of Anorectal Fistula (Sull'etiologia delle fistole ano-rettali). *Clin. chir.* 1937 13 47

In a series of fifty one cases of anorectal fistula Uggeri studied systematically the thirty cases in which the tract was completely excised. The patients were given a complete physical examination and roentgenograms of the chest and full histories were taken. The tissue was studied histologically and cultures and guinea pig inoculations were carried out with it.

In twenty four cases the tissue gave negative results consistently. In six cases (20 per cent) the cultures and animal inoculations were positive. In two of the bacteriologically positive cases the histological picture was not characteristic of tuberculosis. Tubercle bacilli were never demonstrated in the sections. Although giant cells were found in some of the non tuberculous fistulas they were numerous only in the tuberculous cases. None of the patients with tuberculous fistulas had active tuberculosis.

GYNECOLOGY

UTERUS

Malpas, P.: The Use of Radium in the Treatment of Benign Uterine Bleeding. *J. Obst. & Gynaec. Brit Emp*, 1937, 44 86

Noting the progressive development in x-ray and radium therapy the author states that today there is probably more extensive use of radium in the treatment of benign bleeding than of malignant lesions. Fibroids are secondary to malfunctioning bleeding as indications for radium.

A summary of the results obtained by many workers is presented. It includes the results of 200 cases and results reported from 37 foreign clinics. More than 2,000 cases are considered. The summary is presented in five separate sections.

In the first section the use of radium for the production of permanent amenorrhea is considered. Eighty-six per cent of 200 cases at Liverpool belong in this section. Cases with inflammatory disease of the appendages and with fibroids not amenable to radium treatment had to be excluded. Thorough curettage was done to exclude carcinoma. The amount of radium varied between 30 and 50 mgm., and the hours of exposure between 40 and 60. A total dosage of 2,000 mgm.-hours was used in the majority of cases. A filtration of 0.5 mm. of platinum, 1.2 mm. of silver, and 2 mm. of rubber was employed. In order to secure a suitable endometrial effect there was a correlation between the length of the uterus and the length of the radium applicator, retention of the applicator *in situ* was secured by means of thorough vaginal packing. An indwelling catheter was seldom necessary as retention of urine is rare. Periodic reiteration of the precautions to be taken against the loss of radium was made.

In 4 of the 178 cases, an average of 2.2 per cent, there was failure to produce amenorrhea. The incidence of radium injury is negligible when the proper technique is employed. Only 23 per cent of the patients made a complaint of spontaneous menopausal flushing. The radium menopause approximates the normal more closely than the surgical type.

Perhaps the most important aspect of the subject is that of the incidence of postirradiation carcinoma. The danger is very real. After reviewing the records of the cases of postirradiation carcinoma reported in the literature the author concludes that in most of them the carcinoma was already present at the time of the insertion of the radium.

In the second section of the article are the cases in which temporary amenorrhea was desired. There were 15 in the author's clinic. The author notes that in man the impairment of the reproductive function by radium is negligible. There is no apparent risk of fetal lesions following preconceptional maternal irradiation within the limits of dosage employed. The oocytes react entirely or not at all to radium.

The third section includes cases of postmenopausal bleeding. There were three in this series. The need for the exclusion of carcinoma is particularly important.

In the fourth section, the author states that with regard to radium and x-ray therapy, radium was preferred because it afforded an opportunity for confirmatory curettage. Moreover, there is greater assurance of permanent amenorrhea following radium, and one treatment only is required. The use of the x-rays is reserved for those cases in which for some general reason curettage is impracticable. The danger of overlooking corporeal carcinoma is very much greater when the x-rays are employed.

In the fifth section of his article, the author considers the effects of radium on the uterus and ovaries. He notes that there are two types of biological effect exerted by radium. The explanation lies in the fact that it acts on rapidly growing cells, such as cancer and germ cells, and in larger dosage has a general unspecific action on the adult tissues, which is dependent upon the density and vascularity of these tissues. In the submaximal dose used when conservation of function is desired, the selective effect of radium on the ripening oocytes is used. The dosage is below the threshold of irreparable reaction of the more resistant endometrium. On the other hand a castrating dose of radium is over the threshold at which an irreparable endometrial effect is obtained and is permanent no matter what the amount of irradiation of the ovaries may be.

HERBERT F. THURSTON, M.D.

Jeffcoate, T. N. A.: The Treatment of Functional Uterine Hemorrhage by Means of Gonadotropic and Ovarian Hormones. *J. Obst. & Gynaec. Brit Emp*, 1937, 44 31.

Jeffcoate discusses the causes of uterine bleeding, normal and abnormal, and gives a classification for functional uterine hemorrhage. In an attempt to ascertain the value of treatment he presents (1) results collected from the literature, (2) results obtained at Liverpool, and (3) personal responses to a questionnaire.

The author concludes that to those most in favor of endocrine treatment the results presented may raise a serious doubt. It is disconcerting to learn that in cases of functional uterine hemorrhage, organotherapy is strictly limited. Equally good results are claimed for the use of oxytocic drugs and relatively impotent substances, such as desiccated corpus luteum or unstandardized preparations containing small amounts of follicular hormone fluids.

Until the present views and theories regarding the ability of estrin to produce luteinization are confirmed or clarified, there is no basis for the administration of this hormone in the treatment of functional uterine hemorrhage, unless this bleeding is associated

McCaughan J M and Brown G O The Value of Partial Pancreatectomy in Convulsive States Associated with Hypoglycemia *Ann Surg* 1937 105 354

The authors report the cases of six patients with convulsive seizures associated with hypoglycemia who were subjected to partial pancreatectomy. The end results were unsatisfactory for in not a single instance was a cure obtained.

The authors believe that surgical exploration of the pancreas is justifiable in cases in which hypoglycemia sugar tolerance curves are found associated with frequent and severe convulsions which fail to respond to proper medical management. Unfortunately there is as yet no definite clinical method for differentiating hypoglycemic conditions which arise in the pancreas from those of extrapancreatic origin. Surgical exploration seems to be the only method of ascertaining the existence of adenomata. One case of the authors demonstrates that even this method is not entirely reliable.

EARL O LATIMER M.D.

MISCELLANEOUS

Mauro M The Treatment of Wounds of the Abdomen (Contributo clinico alla cura delle ferite dell'addome) *Riv di chir* 1937 3 12

There has been a great deal of discussion as to whether operation should always be performed in wounds of the abdomen even when it is not certain that there has been penetration. The author discusses the question on the basis of 607 cases treated in the last decade at the Jelligrini Hospital in Naples 53 of which were his own. Histories of 32 of the cases with descriptions of the operations are given. He gives a diagrammatic outline of the diaphragm showing the segments that are most frequently wounded and another showing the organs wounded in his cases and the percentage of mortality for each type of wound.

In his war experience he succeeded in saving 66 per cent of his patients with severe lesions of the organs. This was better than the results which he obtained in the civil hospital where he succeeded in saving only 50 per cent.

Among the 607 cases considered in this article 314 were operated with a mortality of 37.97 per cent 263 were not operated on and presented a mortality of 19.05 per cent. In the non-operated cases operation was not performed either because the patient refused it, his condition was so hopeless that operation would have been useless or twenty-four hours or more had passed since the injury and the patient's condition was such that it seemed probable he would recover without operation.

He discusses lesions of different parts of the colon and says that he believes that many patients with these conditions are lost because the part of the colon not covered with peritoneum is not inspected. In his cases this inspection made it possible to cure lesions that would otherwise not have been suspected. The soiling of the retroperitoneal tissue with intestinal contents is particularly serious.

In cases in which penetration was doubtful he inspected the external wound under local anesthesia. If penetration was not found he simply cleansed the wound and sutured it. If penetration was found he made an incision large enough to inspect freely the organ or organs probably wounded. He operated as rapidly as possible and avoided rough manipulations especially of the mesentery to avoid any greater fall of blood pressure. He explored as gently as possible the retroperitoneal space in order to find lesions that are often overlooked. He removed tissues that were probably infected and provided for thorough hemostasis and peritonealization. The wounds with free or pedunculated flaps of omentum. He used meticulous care in cleansing the peritoneal cavity. In cases of recent wounds without soiling with intestinal contents he closed the wounds after giving electrargol or antipentoneum serum. In other cases he drained more or less freely with strips of gauze or a Mikulicz drain. Meticulous post-operative care is the secret of success in many abdominal operations. Glucose and saline rectoclysis antipentoneum serum anti pyogenic serum in cases which are probably badly infected. Stimulants to intestinal movement when necessary and particularly intravenous injections of hypertonic salt solution. Fowler's position and tonics are recommended.

AUDREY GOSS MORGAN M.D.

carcinomatosis with cachexia, phlebitis, and embolism.

The diagnosis involves a differentiation from various lesions such as, hard chancre, soft chancre, gumma, tuberculous ulceration, and lupus or esthiomene. Biopsy and microscopic examination are essential.

Treatment is either surgical or radiological. One-stage operations in which the lymphatics and the clitoris are removed at one sitting are generally accompanied by great shock which is not well tolerated by the aged and cachectic. The authors prefer the two-stage operation.

The authors report a typical case presenting the signs and symptoms described. Because of the age of the patient and her scruples against surgical removal, radium was used exclusively. The technique is described in detail. A total of 269 mgm of radium were used, 75 mgm were placed in the vagina, the remaining 194 mgm were placed in a moulage covering the vulva. The vaginal applicators were removed in six days, the moulage in eight days. The tumor showed a remarkable regression in size. The symptoms were entirely relieved. The patient was discharged after seventy days of hospitalization, March 2, 1936. She has not been seen since. The authors presume that she is still in good health.

HAROLD C. MACE, M.D.

MISCELLANEOUS

Bonney, V.: The Fruits of Conservatism. *J. Obst. & Gynaec. Brit. Emp.*, 1937, 44, 1.

Although since the opening years of this century there has been some advancement, it is certain that conservatism is not practiced by gynecological surgeons to the full extent of its possibilities, except in a few quarters. The author is impatient for a change of attitude. Early in his career he began to practice conservatism in his work and the fruits of this experience are embodied in his paper. He has performed abdominal myomectomy 632 times with 7 deaths, a mortality of 1.1 per cent. This figure is considerably under the average mortality rate for hysterectomy performed by experts. The last 250 operations were performed without a single death. The figures are much more impressive when it is understood that neither the size, position, nor number of fibroids was a deterrent in any case. In the 632 cases the tumor was solitary 254 times and multiple 378 times. The largest number of fibroids extirpated from a single uterus was 125 and on 9 occasions the number ranged between 50 and 92. From 379 patients who answered a follow-up questionnaire it was found that the recurrence rate was under 4 per cent. Of 137 patients who were married,

within the child-bearing age, and desired offspring, 52 (38 per cent) conceived after the operation. Natural delivery occurred in 34 patients, cesarean section was necessary in 17, and miscarriage resulted in one. Several of the patients conceived twice and at least two of them three times. Formerly the author believed that myomectomy was the operation of choice in women under 41 and hysterectomy in those over 41. Today he believes, because of the lesser risk of myomectomy, it is to be preferred in older women, particularly those who have had menorrhagia for a long time. As far as the author knows no patient has developed malignancy in the conserved uterus.

The technique consists of rigid hemostasis by means of the author's myomectomy clamp, placing the suture line on the anterior wall of the uterus, deliberate and careful removal of the tumors so that not even a seedling is left behind, opening the uterine cavity to make certain there is nothing within it, removal of all redundant uterine wall before suturing is commenced, avoidance of mattress sutures, and meticulous asepsis. Morcellation of large tumors is often less severe than removal *en masse*.

In the last fifteen years Bonney has performed 120 conservative operations for ovarian cysts and tumors, most of them being enucleation. There were 58 cases of blood (chocolate) cysts, 31 unilateral and 27 bilateral, 40 cases of unilocular serous cysts, 26 unilateral and 14 bilateral, and 11 cases of dermoid cysts, 7 unilateral and 4 bilateral. Three patients presented solid granulosa tumors. There were no deaths in the series. From 90 replies to a follow-up in this series it was found that 16 patients had conceived since their operation and 32 did not. Forty-two were beyond the child-bearing age or did not wish to conceive.

Since 1921 the author has performed 70 reparative operations on patients with double tubal closure. There were no deaths. The operations were as follows: salpingostomy in 44 patients, freeing tubal kinks in 7, tubal excision and anastomosis in 2, reimplantation of the tubes into the uterus in 9; reimplantation on one side and salpingostomy on the other in 3, double reimplantation with double salpingostomy in 4, and making an ostium in the uterine cornu of a patient who had had both tubes removed in 1. Of 37 patients who were followed up and who had been operated upon two or more years previously 7 (18 per cent) had conceived. Conception followed salpingostomy in 2, reimplantation in 2, reimplantation on one side and salpingostomy on the other side in 1, double reimplantation and double salpingostomy in 1; and tubal excision and anastomosis in 1.

HARRY W. FINK, M.D.

with endometrial atrophy or represents merely a menopausal menstrual irregularity or a slight loss at the time of ovulation

The author concludes that while the number of cases treated with corpus luteum is too small to permit definite conclusions it appears that the results obtained are accruing from the gonadotropic hormones

The type of bleeding showing the best response is that which is non-ovular such as is found in the condition known as metropathia hemorrhagica

Pubescent and adolescent hemorrhages are very amenable to the treatment but menopausal hemorrhage shows very little response Fortunately it is the former types for which this conservative treatment is especially indicated for the latter more radical operative or radiological therapy is usually preferable

At puberty the bleeding is controlled in 80 per cent of the cases but of all the patients suffering from functional uterine hemorrhage only 66 per cent derive real benefit The treatment controls the bleeding only temporarily finally there may be a return to a normal cycle or subsequent amenorrhea may occur A return of the hemorrhage is not infrequent Hormonal treatment of the relapse is more difficult than that of the original bleeding

The mechanism by which these endocrine products exert their good effect is discussed Comment is made also on the possibility of the development of hormone antibodies All effects of treatment are rare and constitute no real disadvantage to the practice of organotherapy

HERBERT F THURSTON M D

Laborde S and Saillant H Radiotherapy of Fibromas (A propos de la radiothérapie des fibromes) *Bull Soc d'obst et gynec de Par* 1936 35 644

This report covers observations on 303 fibromyomas of the uterus treated at the Cancer Institute from 1922 to 1935 Treatment with x rays or radium is reserved for fibromas of small size from which there is considerable bleeding Occasionally fibromas of larger dimensions are treated with the x rays if hemorrhage is an important finding

Accurate diagnosis to rule out pregnancy ovarian cyst or cancer of the body of the uterus must be made before irradiation is used There was no evidence of the x rays or radium having caused malignant changes in a fibroma treated in this way

In 56 per cent of the patients studied the fibroma appeared between the ages of forty and fifty

Twenty seven of the 303 patients were treated by total or subtotal hysterectomy because of the large size of the tumors

Twenty five were treated by the intra uterine and vaginal application of radium The results in all were satisfactory In the remainder who were irradiated with the x rays hemorrhage was stopped promptly and there was prompt regression in the size of the tumor mass

In general the effect of both types of irradiation was the same but the x rays are more suitable for large masses while radium is more suitable for small tumors with severe bleeding because of its more rapid action

The authors believe that the reduction in size of a fibroma is due chiefly to the effect of the rays upon the ovaries and that the direct action upon the tumor is due to the reaction of the blood vessels

When judiciously used irradiation is exceedingly useful as it does not expose the patient to the risk involved in a major surgical intervention

MARSH W POOLE M D

EXTERNAL GENITALIA

Laffont A Montpellier J and Jacquemin P A Case of Primary Epithelioma of the Clitoris (Sur un cas d'épithélioma primitif du clitoris) *Gynec et d'obst* 1937 35 81

Carcinoma of the clitoris is not exceptionally rare as more than three hundred cases have been reported in the literature The authors summarize the existing knowledge on this subject with particular reference to the etiology symptoms physical findings and treatment both surgical and radiotherapeutic

The etiology of course is unknown Pre-existing leucoplakia secondary to aphylis is considered a possible causative factor Lack of ovarian function may play some part as most of the cases occur after the menopause One case in a young woman following castration has been reported Irritating secretions retained beneath the prepuce are considered another predisposing factor In support of this view the authors point out that carcinoma of the clitoris has never been observed in Islamic or semitic women who have submitted to the ritual of circumcision

Three types of cancer of the clitoris have been described carcinoma of the prickly cell type basal cell type and intermediate-cell type sarcoma and melanosarcoma Macroscopically the lesion is usually a far advanced exuberant tumefaction or a deep ulceration with sharp irregular borders There is always an associated lymphadenitis either in inflammatory or metastatic

The principal symptoms are intense pruritus pain bleeding watery discharge difficulty in walking dysuria and dysparunia

The early plaque or verrucose forms are rarely seen The late physical findings are those of a tumor more or less voluminous situated above the vulvar orifice and the urinary meatus and protruding between the labia majora The tumor is generally firm to touch cylindrical in form and relatively immobile The surface is generally ulcerated and occasionally papillomatous Lymph gland involvement is very typical and occurs early with extension to the glands of Scarpa's triangle and the anterior iliac fossa In the late stages the carcinoma grows by extension to the labia majora urinary meatus vagina and anus Terminally there is generalized

seldom occurs during pregnancy, but if it is already present it generally gets worse as a result of pregnancy. In the clinic 18 patients with struma were operated upon, 4 because of dyspnea, 13 for chronic Basedow's disease, and 1 for acute Basedow's disease. There were no fatalities. One patient aborted after Basedow's disease at the third month.

In appendicitis other routes of diffusion of the suppuration are developed because the enlarging uterus gradually crowds the cecum and appendix upward, and the enlarged uterus may adhere to the omentum and small intestine, thereby greatly increasing the danger of general peritonitis.

Uterine pressure enlarges varicosities, but they generally return to their former state after labor.

The recommendation that abortion always be performed during an attack of ileus is not to be followed as intestinal obstruction from other causes can never be excluded with certainty, and artificial emptying of the uterus may lead to tearing of adherent intestinal loops.

Fever often disturbs pregnancy. In this regard the toxins which develop in the blood during ileus, peritonitis, and icterus are of significance. Conservative treatment of icterus during pregnancy should not be continued for more than a week.

In the presence of complicated indications, the life of the mother is generally given preference if the basic illness has not already made her life hopeless. The indications for urgent intervention demand immediate action even during pregnancy, although the method of procedure may be different in certain respects. The operative intervention should be limited to the minimum, however, routine ileostomy for ileus and cholecystostomy for gall stones is to be condemned. Appendiceal abscess is complicated by spontaneous abortion in 80 per cent of the cases and is very frequently followed by the development of diffuse fatal peritonitis. Laparotomy for drainage of the abscess should be done immediately and the uterus emptied later. In cases of empyema of the gall bladder operation must be done at once, irrespective of whether the pregnancy may be interrupted or not. Handling a gravid uterus during an operation is not so dangerous as is generally believed. Local anesthesia is preferred to general anesthesia, but lumbar anesthesia according to Kirschner's method is recommended. Conservative treatment is advised for temporary conditions, such as gall-stone and kidney-stone attacks and hydrops of the gall bladder. Operations for hernia should be done during the non-pregnant state; there is little danger of including the bowels in the grasp of a truss since the enlarged uterus keeps them displaced upward. Diaphragmatic hernias are very serious complications and require immediate operation. Tuberculosis and carcinoma are chronic conditions which may be encountered. As a rule, tubercular fevers are more intense during pregnancy, also the condition of a carcinoma is often more serious during pregnancy, therefore therapeutic abortion is indicated. Malignant tumors are the most serious com-

plications. In acute abdominal inflammations the results of early operations are comparatively good. There are no rules which govern all cases. Close and confident cooperation between the surgeon and the obstetrician is essential.

In the Heidelberg Clinic 119 patients were operated upon during pregnancy. The mortality of the mothers was 8.4 per cent, abortions occurred in 15 per cent.

In the discussion REH reported the treatment of myoma, cervical carcinoma, versions, and appendicitis from the gynecological standpoint.

KIRSCHNER favors lumbar anesthesia according to his method, which is tolerated exceptionally well by pregnant women.

ORTH called attention to the sensitiveness of the pregnant uterus when sterilization is done. This is sometimes undertaken because abortion is desired and is effective at times and unsuccessful at other times.

FRANKE avoids inducing abortion during appendicitis operations, but emphasizes the necessity of surgery in all such cases. In twenty cases of his own there was no mortality, but two abortions occurred.

(BODE) MATTHIAS J. SEIFERT, M.D.

Masson, C. A.: The Procedure of Boero and the Action of Formol on Pregnancy (Le procédé du Professeur Enrique A. Boero et l'action du formol sur la grossesse) *Gynec et obst*, 1937, 35, 115.

The author reports animal experiments and clinical trials of Boero's new method of interrupting pregnancy by injecting formol into the amniotic sac with a needle introduced through the abdominal wall into the uterus.

The animal experiments were carried out on pregnant guinea pigs and rabbits and indicated the effectiveness of this method. Fetal movements stopped shortly after the formol was injected. Abortion followed within a few hours. The fetal skin was reddened and the fetal membranes were deeply injected.

The author reports four cases in which this method was used to interrupt pregnancy in the human being for therapeutic indications, namely, pulmonary tuberculosis, hyperemesis gravidarum, and pulmonary syphilis.

The first case was that of a secundipara twenty-four years old with advanced pulmonary tuberculosis. The pregnancy was four months old. An injection of 1¼ c cm of 40 per cent solution of commercial formol was made into the amniotic sac after withdrawal of 10 c cm of amniotic fluid. The abortion was completed in fifty-four hours and uneventful recovery followed.

In the second case a woman aged thirty-three gave a history of a previous therapeutic abortion. When she was seen she presented a case of advanced bilateral pulmonary tuberculosis. The pregnancy was five and one-half months old. An injection of 1½ c cm of 40 per cent solution of commercial formol was made into the amniotic sac after with-

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Frankel J M and Schenck S B The Endometrial Theory of Ectopic Pregnancy *Am J Obst & Gynec* 1937 33 393

The authors and others have demonstrated healthy endometrial tissue in tubal lumina. Endometrial tissue can and does implant itself and grow elsewhere displaying a preference for serous surfaces. Cases of endometrial tissue in the tubes have been reported in the literature and the authors report one such case.

Many observers have found decidual tissue in the tubes whether or not they were the site of pregnancy. The authors have found it present at the site of the pregnancy in 62 per cent of casual specimens and in 87½ per cent of the cases in which a careful search was made. They believe that it is present at the outset in 100 per cent of the cases.

In one instance endometrial glands were found in the decidual tissue which proves that the decidual reaction was caused by the response of endometrial elements and not by the tubal structure itself. The fact that the fibrin layer of Nitabusch can be demonstrated in these ectopic decidual tissues shows that the ectopic endometrium carries out its functions as completely as endometrium on the uterine wall.

All ectopic pregnancies tubal or otherwise occur because of nidation of the fertilized ovum in a locus of ectopic endometrial tissue to which the ovum is chemotactically attracted.

The fate of the gestation depends upon the amount of endometrial tissue present which may undergo the decidual reaction and upon the depth of penetration of the ovum beyond the borders of this decidua. All ectopic pregnancies are primary.

EDWARD L CORNELL M D

Shute E Observation on the Etiology of Abruptio Placentae and Its Response to Vitamin E Therapy *J Obst & Gynec Brit Emp* 1937 44 121

Abruptio placentae indicates a rupture of the vascular elements of the decidua basalis and a rupture of the placenta from its site with hemorrhage into the uterine wall, amniotic sac or vagina.

The most frequent and significant sign is the gradual development of a restricted palm sized area of true uterine tenderness accompanied by steady sacral backache. Occasionally uterine contractions, violent fetal movements and uterine hemorrhage of any grade or severity occur as early or late sequelae or gradual elevation of the blood pressure may take place with edema of the extremities, a rapid increase in weight and even albuminuria—the usual evidences of the onset of toxemia of pregnancy. In some instances the author's attention was first focused on the case because the fetus seemed un-

usually small or because there was an excess of amniotic fluid. In severe cases the uterine tenderness usually spread to involve the whole uterus but it was always most intense at the site of its first appearance. All evidence of tenderness and the associated symptoms may disappear spontaneously. When the symptoms reappeared as they often did the tender area was in the same location as before. In a case of cesarean section and a case of manual removal of the placenta in a twin pregnancy the author was able to prove that the placental site corresponded to the area of tenderness before the delivery.

From January 1, 1934 to March 31, 1936 the author observed 65 cases. In 75 per cent of them he found a deficiency of vitamin E and an excess of estrogenic substance in the blood serum. Vitamin E therapy was instituted and it was found that an adequate massive dose of a potent vitamin E preparation completely abolished in 20 hours the circumscribed area of uterine tenderness in almost all of the cases. The accompanying sacral backache and uterine cramps subsided quite as rapidly. Uterine hemorrhage when present stopped promptly. When such therapy was interrupted the uterine tenderness and bleeding often reappeared only to disappear with characteristic rapidity on further continuation of the therapy.

CHARLES BABON M D

Zukschwerdt Indications and Contra Indications for Surgical Intervention during Pregnancy (Anzeigen und Gegenanzeigen zur chirurgischen Eingriffen während der Schwangerschaft) *Zentralbl f Chir* 1936 p 2563

The altered physiological and anatomical relationships that are produced in the maternal organ and by pregnancy increase the risks of any intervention. The danger of an ensuing abortion is always present. Every intervention during pregnancy is burdened with a double responsibility that for the mother and that for the child. All non urgent interventions should be done in the absence of pregnancy. For urgent interventions there must be absolute and relative indications which will depend upon the relationship between the pregnancy and the disease. It must be decided whether the condition is the result of a more or less coincidental development of the disease and the pregnancy or of a mutually interdependent relationship between them also whether the pregnancy directly causes the disease or merely brings about a certain favorable disposition to it or whether the disease favors the course of the pregnancy.

Struma is influenced unfavorably by pregnancy; it hypertrophies if its glandular tissues are functionally deficient. In general conservative treatment is justifiable. If increasing dyspnea occurs operation should be performed. Basedow's disease

the normal. The superior strait was the site of a more or less acute angulation, usually of about 135 degrees, with slight constriction. The pelvic portion of the ureter was usually more curved and larger than normal. These findings constitute the urinary stigmas of pregnancy. MAX M. ZENNINGER, M.D.

MISCELLANEOUS

Traina Rao, G.: The Value of the Dynamic Medium Blood Pressure in Obstetrics (Sul valore della pressione media dinamica nel campo ostetrico) *Riv. ital. di ginec.*, 1936, 19, 415.

The dynamic medium blood pressure is the cardiovascular response to muscular activity. When cardiac function is sound, this pressure is practically stable. Vaquez, Kisthinos, and Papaionnou found the normal values to be as follows:

Tenth to twenty-fifth year 80-90 (usually 90)

Twenty-fifth to fiftieth year 80-110 (usually 90)

After the fiftieth year 90-120 (usually 100).

In studies of the maximum, medium, and minimum dynamic blood pressures of 50 normal pregnant women, Lévy-Solal, Kisthinos, and Lepage

found that the medium pressure did not vary appreciably during pregnancy, labor, or the puerperium. They concluded that its elevation may be considered a premonitory sign of eclampsia, particularly of eclampsia without albuminuria.

The author reports and presents in 2 tables his findings in 100 cases of normal pregnancy and 50 cases of toxemic pregnancy. By means of the Boullite oscillometer, which he describes in detail and shows in an illustration, he was able to obtain graphs for the maximum, medium, and minimum pressures of each patient at intervals throughout pregnancy. He draws the following conclusions:

1. Determination of the medium pressure may be considered a valuable method of measuring the work of the heart.

2. Normal pregnancy does not appreciably alter the medium pressure.

3. In toxemia, the medium pressure is nearly always elevated in proportion to the gravity of the morbid process. This is not true of the maximum and minimum pressures.

4. The medium pressure is of prognostic value in pregnancy toxemias. GEORGE C. FINOLA, M.D.

drawal of 10 c cm of the amniotic fluid. Uterine contractions developed but stopped after several days. The Friedman test was negative on the third day. Abortion was completed fifty one days later. The fetus was macerated and the amniotic fluid had a marked formol odor.

In the third case the patient was a secundigravida aged thirty who was suffering from hyperemesis in gravidarum. The pregnancy was three months old. An injection of $\frac{1}{2}$ c cm of 40 per cent formol was made into the ovum. There was no evidence of beginning abortion. Improvement in the condition of the patient began four days after the injection of formol. The Friedman test was positive and the development of the uterus was increased. Active fetal movements were noted. Abortion of a living fetus of four and one half months occurred on the forty fifth day after injection.

The fourth case was that of a para iv thirty two years of age. She was suffering from pulmonary typhus and was pregnant for four and one half months. An injection of $\frac{1}{2}$ c cm of 40 per cent formol was made after the withdrawal of 40 c cm of amniotic fluid. No signs of abortion appeared. Nine days later an injection of 2 c cm of 40 per cent formol was made after the withdrawal of 100 c cm of amniotic fluid. The Wassermann reaction on the amniotic fluid was positive. Six days later complete abortion occurred.

The author's reports indicate that the injection of formol into the amniotic sac is capable of inducing abortion without apparent harmful effects upon the mother within a period of from fifty four hours to fifty one days after the injection.

HAROLD C. MACK, M.D.

LABOR AND ITS COMPLICATIONS

Tollefson D. G., and Webb A. M. Uterine Inertia in the First Stage of Labor. *West J Surg Obst & Gynec.* 1937 45 156

An analysis of 5625 private and 5846 Los Angeles County Hospital deliveries showed the close relationship of uterine inertia, cephalopelvic disproportion and posterior positions.

In the former group there were 500 cesarean sections and in the latter 156. The indications for cesarean section were determined by the length of labor and the results of the test of labor. The number of such operations was obviously affected by the percentage of primigravidae.

The progress of labor is determined by the descent of the presenting part and the changes occurring in the cervix as the result of uterine contractions. In addition to effacement and dilatation, the change of the consistency of the cervix is evidence of progress. The location of the cervical opening may assist in the diagnosis of progress and position and appears to be of some assistance in prognosis. Accessibility of the cervix to the examining finger usually suggests an anterior position and the prognosis for a labor of average length is good. A posteriorly displaced

cervical opening difficult to reach suggests an occiput posterior position. The latter position could be considered eccentric when the field of rectal examination is pictured as the infravaginal portion of the lower uterine segment. If the opening of the cervix is lateral and inaccessible, it usually effaces irregularly and will dilate slowly until the os becomes central and easily reached. When the most dependent point of the presenting part is at a lower level than the cervical opening force is exerted against the lower uterine segment instead of the entire circumference of the canal. This interferes with dilatation and effacement. Failure of the cervix to dilate is responsible for the diagnosis of ineffective uterine activity. In the series studied uterine inertia occurred in 9 per cent of the maternal deaths.

The management of labor must include the diagnosis of position, explanation of delay by vaginal examination, and above all careful safeguarding against exhaustion due to insufficient food intake.

Rest, careful stimulation of the contractions and judicious use of analgesics will reduce the obstetrical difficulties arising from uterine inertia.

CHARLES BAZOV, M.D.

PURPERIUM AND ITS COMPLICATIONS

Contiades Y. J. Morphological Studies of the Ureter After Pregnancy. *Urinary Stigmata of Pregnancy* (Recherches sur la morphologie de l'uretère postgravidique. Stigmata urinaires de grossesse). *J de chir med et chir* 1936 43 432

The profound effect of pregnancy on the urinary tract is well known. In a previous study of 45 pregnant women by ascending ureteropyelography the author found that dilatation of the ureter and renal pelvis occurred constantly whether or not urinary infection or symptoms were present. The sensitivity, tonicity and motility of the urinary tract were greatly altered. The question arises whether or to what degree the changes persist after the termination of pregnancy. In 1914 Chevasu expressed the opinion that a large number of renal infections in women are the sequelae of urinary infections of pregnancy.

Ascending ureteropyelography is carried out by the author on a special cystoradioscopic table. A No. 24 catheter provided with a bulb is inserted into the ureter through a cystoscope to obstruct the meatus. Uroselectan is injected until the renal pelvis is distended. After two roentgenograms have been taken at intervals of one minute emptying is observed fluoroscopically.

In this article Contiades reports observations made in the cases of 25 primiparas and 23 multiparas in whom no urinary infection has been recognized at any time. In more than half (27) of these women dilatation of the pelvis of at least one kidney was found. The dilatation occurred more frequently and was more marked in the right than in the left kidney. The lumbar portion of the ureter was more or less fusiform and always definitely larger than

consisted chiefly of pathological changes on the part of the glomeruli, while in those of the second series degenerative manifestations on the part of the tubuli contorti predominated. At the same time azotemia, albuminuria, microscopic hematuria, oliguria, loss of weight, apathy, and loss of pelt glossiness were noted. In cases of acute and diffuse hepatic necrosis the animals died rapidly from oliguria or anuria. In the animals which remained alive for considerable periods, there was pronounced extracapillary and intracapillary glomerulonephritis and, quite often, necrosis of the tubuli contorti. Finally, in some cases the blood from animals with the hepatorenal syndrome was injected intravenously into healthy animals.

On the basis of his experiments the author concludes the following: The disturbances of the renal function are produced by substances circulating in the blood in the cases with injury or disease of the parenchyma of the liver. The toxic material either originates in the necrotic focus in the liver or is brought to the liver from the intestine and from there reaches the blood stream without being detoxified, due to the disturbance in the detoxifying function of the liver. The results of the last experiments allow the generalization that the toxic substance extends its effects to the vascular system generally, but especially to the vessels of the malpighian corpuscle and to the epithelium of the tubuli contorti of the kidney. The author explains the causal mechanism of the hepatorenal syndrome as follows:

A chronic or acute disease of the liver and bile passages, with or without obturation of the bile passages, does not at first produce definite changes in the organism, and up to a certain point does not endanger the life of the sufferer. However, with the further progress of the disease process or with the advent of operative interference conditions of entirely different character arise and lead to functional insufficiency of the liver and kidney. The liver, which has already been reacting more or less to the toxic symptoms, is particularly liable to prove inadequate to the functional demands made upon it after operation. The toxic substances which are brought to it are no longer neutralized and the liver cells, as a result of their functional weakening and the change in the intrahepatic pressure consequent to the operation, undergo extensive necrotic changes. Therefore, toxic substances which are no longer neutralized by the liver and, in addition, toxic substances arising in the necrotic cells themselves enter the blood stream. As a result, the kidney, the most important organ neutralizing toxic substances in the organism with the exception of the liver, must take over this function. Since the ability of the kidney in this regard is not very great the products of metabolism cannot be neutralized neither quantitatively nor qualitatively. The result is injury to the kidney by the toxic substances and consequent severe toxemia.

(HAUMANN.) JOHN W. BRENNAN, M.D.

Bergendal, S: Hydronephrosis With Anomalous Renal Vessels, With Special Consideration of Its Treatment By Vascular Resection (Zur Frage der Hydronephrose bei Nierengefässvarianten, unter besonderer Berücksichtigung ihrer Behandlung durch Gefässresektion). *Acta chirurg Scand*, 1936, 79 Supp. 45

The author reports on the disadvantages and late results of vascular resection. The clinical material consisted of 88 cases and 150 kidneys which were studied post mortem. Arterial anomalies were found in 79 of the 150 kidneys and venous anomalies in 23. In 25 specimens one or more vascular anomalies were found near the ureteropelvic junction. In 5 specimens the crossing vessels caused no appreciable dilatation of the renal pelvis. The observation time extended over from one to twenty-nine years. The disadvantages associated with vascular resection were studied in 19 cases. The remaining cases comprised three groups: 62 cases in which the vascular cord undoubtedly or probably crossed the top portion of the ureter with dilatation of the renal pelvis, observed before or at operation; 3 cases with the vascular cord crossing the ureter without dilatation of the renal pelvis, observed at operation; 4 cases with the vascular cord passing the renal pelvis but not the ureteropelvic junction or ureter.

In 4 cases of the first two groups, the hydronephrosis produced no symptoms. The kidney was movable in 15 cases, in 13 on the right side. Mobility of the kidney may aid the development of vascular hydronephrosis. In 61 cases there was no pain. Macroscopical and microscopical hematuria was present.

In most cases the strangulating vascular cords consisted of arteries or of an artery and vein, and in a few cases of veins only. The cord lay anterior to the ureter somewhat more often than posterior.

Some cases show hydronephrotic symptoms after freedom from symptoms for as long as 29 years. These findings show the value of a long observation period. There may be moderate discomfort or material improvement. The pelvic dilatation was reduced in 26 cases, unchanged in 10, and increased in 2. The result was also good or satisfactory in the majority of 14 cases with pre-operative infection of the renal pelvis. Attacks of pain recurred in the second group of cases. The subjective late results in the third group of cases were definitely unsatisfactory in 3 cases, showing that when the vascular cord is in relation to only the renal pelvis, a reserved attitude must be taken toward division of the vessel or, in any case, toward restricting the operation to division of the vessel.

Ligation of the vein alone imports no danger of necrosis. In 77 cases arteries or an artery and vein were ligated. In 2 cases necrosis in the form of an abscess with urinary fistula was observed postoperatively. Two cases showed gross hematuria probably due to necrosis, and in 6 other cases complications possibly due to necrosis were found. In no case did necrosis lead to death or secondary nephrec-

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Snapper I On the Pathological Physiology of the Functions of the Kidney *Brit J Urol* 1937 9 1

Urine is formed by the combined action of different physiological processes in the kidney where glomeruli and tubules have completely separate functions

In the glomeruli an ultra filtrate of the blood plasma is formed. It contains all the crystalloid substances of the blood plasma in the same concentration in which they are present in the blood but the colloids especially the proteins do not pass through the glomerular membrane

In the tubules the glomerular filtrate is changed into urine by reabsorption of water and different substances. An astounding quantity of glomerular filtrate is filtered off as from 97 to 99 per cent of the water must be reabsorbed in the tubules

As physical ultra filtration takes place in the glomeruli blood pressure must be important for the function of the glomeruli independent and autochthonous variations of the blood pressure take place which have an influence on the output of the glomerular filtrate

The permeability of the glomerular membrane is to be compared with a collodion membrane. Substances with a high molecular weight are retained while substances with a low molecular weight pass

For the protection of the kidney parenchyma during the excretion of acids the formation of ammonia in and by the kidney is of great importance. Carbon dioxide plays the same rôle in the excretion of alkali. Changes in the composition of the blood may be followed by serious disturbances of kidney function the so called extrarenal uremia

The innervation of the kidney is of great importance in kidney function but it is very doubtful whether operations upon the nerve supply improve the function of diseased kidneys

The non excretory functions of the kidney include synthesis of such substances as hippuric acid oxidation of ketone bodies complete and incomplete oxidation of aromatic fatty acids to benzoic phenyl acetic and cinnamic acids and the formation of ammonia

In the explanation of uremia impairment of the non excretory functions is of as much importance as impairment of the excretory

ANDREW McNALLY M.D.

Pytel A The Question of the Hepatorenal Syndrome *Experimental Studies (Zur Frage des hepatorenalen Syndroms Experimentelle Untersuchungen)* *Arch f klin Chir* 1935 187 27

Recently attention has frequently been directed to pathological conditions in which secondary dis-

turbances of the kidney occurred as a result of primary injury or diseased conditions of the liver or, vice versa in which primary diseases of the kidney caused grave changes in the liver. Among these authors who have devoted their attention to these hepatorenal and renohepatic syndromes are Henschen, Fitz Hugh Dourmashkin, Bergstrand, Ruffanov, Plotnew, Tarejew, Zagarese, Boyce and McFetridge, Stewart, Cantarow, and Vague. The work of these men includes both clinical and experimental studies

In the disease conditions described the so called liver death plays a very special rôle especially in cases in which after operation on the liver and bile passages death occurs from severe postoperative complications, especially of the kidney and sometimes with the appearance of anuria. The secondary renal manifestations have been observed also following operative attack on the pancreas after gastric ulcer, in certain intoxications burns in cases of cyst of the ovary fibroma of the uterus in cases of intestinal occlusion and hyperthyroidism. The factor of infection has not been observed. Not infrequently death occurs together with hyperpyrexia. Pathologico-anatomically parenchymatous degenerative changes are found to have taken place in the liver and kidneys

In an attempt to explain the hepatorenal syndrome the author carried out experimental studies. In one group of experiments he ligated the hepatic artery in another he destroyed the subcapsular liver parenchyma and in a third group he injected liver extract intraperitoneally. Operation was performed on a total of fifty eight rabbits under light ether narcosis or with the aid of morphine chloral hydrate. Repeated urine tests and residual nitrogen determinations were carried out on the blood and in addition blood cultures temperature and weight determinations and measurements of the twenty four hour production of urine were made. In the first series the hepatic artery of eighteen rabbits was ligated with silk thread below the origin of the gastroduodenal artery in twelve and above it in six. All of the twelve rabbits died in from twenty four to forty eight hours after the operation of the six two died one on the seventh and the other on the thirtieth day after the operation. The rest of the animals remained alive and were slaughtered on the fourteenth twentieth thirty sixth and fifty fourth days respectively. In the second series the subcapsular liver parenchyma of twenty rabbits was destroyed. Two of the animals died and the rest were sacrificed on the seventh thirteenth and seventy fifth days respectively. The results secured from these experiments disclosed the fact that progressive disturbances of the kidney always followed extensive necrosis of the parenchyma of the liver. In the animals of the first series the kidney changes

urinary bladder. Constant features were (1) the large size of the bladder, usually with the passage of large amounts of urine at infrequent intervals and a residue of several hundred cubic centimeters, (2) the absence of an obstructive lesion; (3) lack of evidence of disease of the central nervous system, and (4) the presence of perfect reflex micturition. In none of the cases was there a megacolon, but the author believes that such dilatation of the urinary bladder is analogous to idiopathic dilatation of the colon, so-called megacolon, since dilatation of both the bladder and bowel are apparently due to overaction of the sympathetic nervous system and are relieved by the same type of surgery.

In none of Watkins' cases was the condition one of atony of the bladder, as in each patient the detrusor muscle was capable of strong contractions. These contractions were not due to disease of the cord because after treatment they continued to improve and no new neurological symptoms appeared. They were not based on anesthesia of the bladder wall as the bladder fullness was felt with normal amounts, 200 c. cm. or less. Three cases were treated by presacral neurectomy with marked amelioration of symptoms.

JOHN MARTIN, M.D.

GENITAL ORGANS

Balice, G.: An Unusual Case of Seminoma of the Testicle (A proposito di un caso non comune di seminoma del testicolo) *Riv. de chir.*, 1937, 3: 1

Tumor of the testicle is very rare, constituting not more than one-half per cent of all malignant tumors. On the other hand, seminoma makes up about 50 per cent of the tumors involving the testicle.

The author describes a case in a man of 56 years in which it was very difficult to make a differentiation from hemorrhagic pachyvaginitis. The patient had had a right inguinal hernia since he was a child. At the age of seventeen he had had gonorrhea and venereal ulcers. At twenty-one he married and became the father of two children. At the age of twenty-five he had a right inguinal adenophlegmon for which he was treated surgically. At the age of twenty-nine he was married a second time and there were five children from this marriage. At the age of forty-seven he was married a third time and two children resulted from this marriage. At the age of fifty he was married a fourth time but had no more children. All the children except two died of various diseases at an early age.

For twenty-five years the patient had had a tumor of the right half of the scrotum which had been gradually increasing in size. At the time of his admission it was the size of the head of a fetus. In general it was of the shape of the testicle and was covered with normal skin. The seminal vesicles and prostate were normal. There were no enlarged glands. The Wassermann reaction was negative. Roentgen examination of the thorax, made for the purpose of detecting possible metastases, showed

only slight thickening of the pleura at the right apex.

Symptoms which suggested pachyvaginitis were the smoothness of the tumor, its regularity, and perfectly uniform consistency with no inguinal, abdominal, or thoracic metastases, and its long persistence without any effect on the patient's general health. While the long continued trauma of wearing a truss for hernia might have contributed to the development of pachyvaginitis, it would ordinarily in the case of tumor have stimulated metastases.

A right hemicastration was performed and the tumor examined histologically. A detailed description of the findings is given, illustrated by photomicrographs. The picture was typically that of seminoma. The patient made an uneventful recovery and on examination three months later showed no signs of recurrence.

The author concludes that in such cases removal of the testicle together with the tumor, followed by roentgen therapy, is the treatment of choice. Radical operation with removal of the tributary glands is not indicated as it is a very severe operation and its purpose is better served by roentgen therapy. Radical operation was not indicated in this case as there were no signs of gland metastases.

AUDREY GOSS MORGAN, M.D.

MISCELLANEOUS

Korhonen, A.: Urinary Calculi: Clinical, Physical, and Chemical Properties, and Bacteriology (Ueber die Harnsteine klinisch, physikalisch und chemische Eigenschaften sowie Bakteriologie). *Acta Soc. med. Fennicae Duodecim*, 1936, 22: Fasc. 3, No. 10.

The stroma of urinary calculi is apparently formed partly from the albumin normally present in the urine and partly from the pathological albuminous substances, in the origin of which infection plays an important part. Colloids and crystalloids were found in the nuclear portions of the stones in about the same proportions, so that they were probably precipitated simultaneously in the formation of the nuclear portion of the stone. With the staining methods used by the author the structures appearing as bacteria were found not to be artifacts, as other tissues, such as bone, cartilage, and the sclerotic aorta, stained by the same method revealed no such structures. However, this evidence is not conclusive because the control material was not completely identical, nor is identical material available. The bacteria may remain viable within the interior of the stones for a long time, especially when the stone is porous and the urine may diffuse into it and provide nutrient material to the bacteria.

The author draws the following conclusions regarding the pathogenesis of urinary calculi.

Because the nuclear portion of urinary calculi, which develops first, contains both colloid and crystalloid elements in about the same proportion, it must appear apparent that both elements represent important factors in the development and

tomy Necrosis may run its course without eliciting clear clinical symptoms. The origin of the strangulating artery gives no guidance for judging the risk of necrosis. The risk arises more especially from the ligation of thick arteries although often these may be ligated without clinical evidence of necrosis. The risk is greater in the presence of an infected renal pelvis, although infection is not a definite contra indication to vascular ligation. The compression test offers only a limited estimate of the risk of necrosis. Even in advanced vascular hydro-nephrosis it is possible to preserve the function of a kidney for a long time by vascular resection.

Organ preserving operations may be indicated in cases with extreme dilatation of the renal pelvis with poor results from functional tests and with pronounced infection of the renal pelvis. Vascular resection is the operative method used most often with satisfactory late results. The one unavoidable disadvantage is that ligation of an artery may cause renal necrosis. However, such necrosis does not imply any great risk or discomfort. When the arteries are thick or when compression of the vascular cord alters the color of a considerable part of the kidney, vascular resection should be avoided. In these cases plastic operations on the renal pelvis should be done only when the course of the vessels presents certain forms otherwise the ureter should be transplanted.

LOUIS NEWZET M.D.

Porcher P. Roentgenology of Perinephritic Phlegmons (Radiologie des phlegmons périnephrétiques). *Arch. d. mal. d. reins et d. organes génito-urinaires* 1936 10 321

The diagnosis and localization of abscesses requires the closest collaboration between the roentgenologist and surgeon. It is comparatively simple if the abscess is in a cavity that contains air as in the lung but very difficult where the contrast is not so great as in perinephritic abscesses.

There are two direct signs of perinephritic abscess: (1) visibility of the pus by contrast and (2) disappearance of the clear perirenal space which the author calls the cleavage sign. The opacity of pus is about the same as that of blood and it is about the same no matter which organism causes it and what its viscosity may be. The visibility of pus is a matter of contrast. A thin layer of pus may be visible against air but even a large abscess may be masked by a richly vascularized organ such as the liver or kidney. Therefore the evacuation of a large amount of pus does not indicate that the abscess should have been visible on x-ray examination.

The disappearance of the clear perirenal space is easier to demonstrate. If this sign is lacking that is if the outline of the kidney can be seen clearly it is quite certain that there is no abscess. Therefore the sign is conclusive when negative but not when positive as disappearance of the clear space may be due to an excess of gas in the intestine.

There are four indirect signs of perinephritic abscess: (1) inhibition of the movement of the

diaphragm (2) disappearance of the shadow of the psoas muscle (3) lumbar scoliosis and (4) compression or deviation of the colon. When the abscess develops around the upper pole of the kidney it is not unusual for it to cause diaphragmatic signs. However these are not pathognomonic of perinephritic abscess and pulmonary abscess and abscess in the space back of the omentum must be excluded. The value of this sign is relative. Unlike the direct sign of disappearance of the perirenal space it is of value when positive and not of great value when negative.

A good deal of importance is attributed to disappearance of the psoas shadow by American authors. Unfortunately its value is limited by the fact that it may also be caused by intestinal gas.

The sign of scoliosis is much easier to demonstrate. A preliminary screen examination should be made in order to be sure that the subject is lying symmetrically on the table. This is necessary particularly when the patient is a child. This sign must be interpreted judiciously.

The fourth sign, compression or deviation of the colon, is particularly valuable when seen in profile. Diagrammatic sketches are given showing the effect on the colon of perinephritic abscesses in different localizations on profile view. This sign is not visible in the frontal projection until a late stage when the disease can be diagnosed clinically.

AUDREY GOSS MORROW M.D.

Hellstrom J. Isolated Dilatation of the Pelvic and Juxtavesicular Portions of the Ureters (Zur Kenntnis der isolierten Dilatation des Pelvines oder juxtavesikalen Harnleiterabschnittes). *Acta re. diol.* 1936 18 141

In excretory urography a dilatation of the pelvic and juxtavesicular portions of the ureters is frequently found while the upper ureteral segments are not at all or only slightly dilated. In the literature this juxtavesicular ureteral dilatation has been described especially in prostatic hypertrophy and in inflammatory diseases of the adnexa. According to the investigations of the author it is particularly typical of ureterocele common in hypertrophy of the prostate but less usual in prostatitis. Possibly a congenital juxtavesicular ureteral dilatation exists also. As a rule the cause of the dilatation seems to be difficulty in emptying of the ureter. In prostatic hypertrophy especially there are different possibilities. The juxtavesicular ureteral dilatation is believed to be a compensatory phenomenon calculated to increase the functional capacity of the ureter and to hinder dilatation of the upper ureteral segment and renal pelvis.

BLADDER URETHRA AND PENIS

Watkins K. H. Idiopathic Dilatation of the Bladder. *Brit. J. Urol.* 1937 9 26

For want of a better name Watkins has called the five cases he discusses idiopathic dilatation of the

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Hart, V. L.: Acute Hematogenous Osteomyelitis.
J. Am M Ass, 1937, 108 524

The first stage of bone disease in acute hematogenous osteomyelitis is a localized inflammation in a single metaphysis and should be designated as metaphysitis. This can and should be recognized clinically for it is at this period that proper surgical drainage of the metaphysis may prevent extensive bone and joint involvement with necrosis and sequestration. The second stage usually follows in a few days and represents the perforation of the thin cortical wall of the metaphysis and the formation of a subperiosteal or soft tissue abscess. In the first stage there are evidences of toxemia, but the local findings are essentially pain with a small area of exquisite tenderness. More diffuse pain and tenderness with swelling, redness, and edema are characteristics of the second stage. Too often operation is delayed until the latter symptoms have appeared, but even then there may be no involvement of the cortex of the diaphysis and medullary cavity. Radical gutter operations are unwise.

Starr's work on the manner of spread of the infection and the significance of the relation of the periosteal attachment to the metaphysis involved is reviewed, with emphasis on the variation in different joints. It is important to bear in mind that the pathological and clinical findings, the treatment, and prognosis of acute hematogenous osteomyelitis are different, when the process is still limited to the metaphysis than when it has already perforated the metaphyseal cortex. CHESTER C. GUY, M.D.

Anspach, W. E.: Sunray Hemangioma of Bone; with Special Reference to Roentgen Signs.
J Am M Ass, 1937, 108 617

In the literature the author was able to find records of only 21 cases of hemangioma involving the skull. In this article he reports a study of the roentgenographic changes in a case of tumor of this type in a patient who was seen first in 1921, when she was eleven years old, and again fifteen years later. At the end of that time the bone deposits were comparable to those laid down rapidly after roentgen therapy in a case treated by Bucy and Capp. The tumor had no ill effect on the patient's health.

Hemangioma of flat bones produces an excellent demonstration of sunray formation in roentgenograms. Whereas, in the long bones, tumors presenting the "sunburst" pattern (tumors with radiating spicules of bone) have usually proved to be osteogenic sarcomas, in the flat bones such tumors are more apt to be benign hemangiomas. In the long bones, hemangiomas tend to produce evenly



Anteroposterior view at the age of eleven years. The tumor mass does not encroach on the brain because the inner table is preserved.

spaced divergent trabeculations as well as the so-called soft soap-bubble appearance, loculations with paper-thin walls. In both hemangioma and sarcoma the periosteum is elevated gradually by the new growth, and spicules of bone, which elongate at right angles to the advancing periosteum, are formed. In sarcoma, the growth has usually occurred too rapidly and there has been too much destruction of pre-existing bone for the perfect "sunburst" effect noted in the benign, slowly growing, less painful hemangioma. When a hemangioma affects a vertebral body the roentgenogram shows vertical streaks of parallel densities suggesting corduroy cloth. Older persons are especially prone to have this type of tumor.

The kind of bone involved by the tumor in a given case is of prime importance in weighing roentgen evidence. Biopsy should be done before treatment is begun. Rarely should a hemangioma of bone be removed, the danger from hemorrhage is great. Irradiation with the roentgen rays or radium has the same favorable effect on a hemangioma of bone as on a hemangioma of soft tissue if it is given early, before dense bone deposits have occurred in the tumor. Even later it is of definite value in arresting growth. The sensitivity of benign hemangioma to roentgen therapy must not be interpreted as evidence of malignancy. Pathologists seem to favor the theory that hemangiomas

growth of urinary calculi and that their precipitation is produced by a change in the colloid chemical relationships. This change is probably caused by conditions which disturb the reciprocal balance of the two components in the oversaturation state of the urine. However, at present there is some uncertainty about these factors and more accurate investigations are necessary. Infections of the urinary tract are important in the development of calculi especially staphylococcus infections and also disease conditions which produce stasis in the urinary passages.

To a great extent, the present surgical treatment can be considered only symptomatic because a recurrence cannot be prevented with certainty by mere removal of the stones and correction of conditions producing stasis. It is necessary to eliminate the infection in the urinary passages by means of internal medicine and also to correct any existing metabolic disturbances. So long as we do not know all the factors of the development of urinary calculi the therapy necessarily remains deficient and the prophylaxis uncertain. **LOUIS NEUWEIL M D**

Higgins G C The Present Status of Dietary Regimen in the Treatment of Urinary Calculi
Brit J Urol 1937 9 36

The author summarizes the results of animal experiments on the formation and solution of stones by dietary regimen. In dietary management of human beings with calculus disease close cooperation between the physician and patient is extremely important. Careful determination of the pH of the urine from the kidney harboring the calculus is essential before and during the use of high vitamin A acid or alkaline ash diet.

Thirty two cases with stones too large for spontaneous passage responded favorably to dietary management. A group of seventy nine patients who

passed calculi at frequent intervals were relieved of symptoms over a period of two years. Diet has prevented the development of stones in patients who were required to maintain a recumbent position for a long period of time because of orthopedic conditions and has reduced the incidence of recurrent calculi from 16.4 per cent to 4.7 per cent.

ANDREW McNALLY M D

Pirila P The Etiology of Lymphogranuloma Inguinale (Ueber die Aetiologie des Lymphogranuloma Inguinale). *Acta Soc med Fennicae Duodecim* 1936 22 Fasc 2 No 8

The author has examined microscopically eight cases of lymphogranuloma inguinale to determine the etiology. Either unstained preparations or fresh preparations stained without fixation were used. The contents of the softened glands when no secondary infection was present were found to consist chiefly of round oval or somewhat irregularly shaped cells of from 6 to 25 μ in diameter. The walls of these cells were quite firm with an abundance of calcareous thickenings. The cells adhered closely to each other forming cell aggregates or colonies of plasmodium. They contained numerous granules which consisted partly of mineral formations situated in the cell walls and partly of chromatinous granules $\frac{1}{2}$ to 2 μ in diameter probably composed of fat drops and vacuoles. In lymphogranuloma inguinale these cells occur in large numbers. They can multiply in the organism of white mice and are considered by the author to be the cause of the disease. The organism described multiplies by fission forming in a number of large cells an abundance of granules about 1 μ in diameter which may possibly be considered as spores. The question whether the disease virus belongs to the protozoa or to the vegetable microorganisms is left unanswered by the author. **LOUIS NEUWEIL M D**

by injecting novocain into the bursa and into the region of the calcification. This procedure is supplemented with the use of heat and exercises after the more acute symptoms have subsided. Eventual recovery with disappearance of the calcification takes place over a period of several weeks.

Chronic bursitis is diagnosed on the basis of a history of trauma and pain, especially in certain portions of the abduction arc. There is little limitation of motion, but a click or crepitus is often noted on motion of the shoulder joint. There is slight tenderness over the greater tuberosity. The roentgenogram shows excrescences and rarefactions on the greater tuberosity. The cause of the symptoms in these cases is believed to be bursal thickenings with formation of villi and hands. If improvement does not result from conservative treatment, operative therapy with excision of the offending hands, villi, or excrescences should be performed.

Tendinitis or obliterative bursitis is the diagnosis made on the basis of a slowly increasing limitation of abduction and external rotation with atrophy and spasm of the muscles around the shoulder. The roentgen-ray findings are negative. The cause of symptoms in these cases is believed to be an obliterative and adhesive bursitis with loss of the gliding function of the bursa. The injection of from 20 to 30 cubic centimeters of novocain into the region of the bursa with subsequent gentle manipulation has brought the most rapid improvement in these cases. Several exercises to increase abduction and extension of the arm are described.

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Frank, P.: The Pathogenesis of Necrosis of the Semilunar Bone and Its Relation to the Effects of Work on the Wrist Joint (*Die Pathogenese der Lunatumnekrose und ihre Beziehung zur funktionellen Belastung des Handgelenks*). *Beitr. z. Klin. Chir.*, 1936, 164, 200.

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As examples illustrating the first cause Frank names hunger osteopathy and scurvy. To study the vascular distribution he injected the vessels by Lexer's method and made histological examinations. It was shown that very fine vessels traverse the spongiosa and anastomose with one another. However, as pathological changes have not been found in the vessels up to the present time, the lesion must consist of functional occlusion. Frank's opinion coincides with that of Schaefer who, in constructing a theory on the relative pathology of Ricker, held that vessels situated beneath cartilage are more sensitive to irritation than those situated beneath periosteum, and that aseptic bone necrosis develops because of vulnerability of certain vascular regions, especially in growing bone. Frank states that the semilunar bone is more vulnerable than the other bones of the carpus because the greater part of its surface is covered with cartilage and the subchondral portions predominate over the subperiosteal. He presents two case histories with roentgen pictures, in one case there was no trauma in the history but pronounced vasomotor instability was found; in the other, continuous demands were made on the bone by the use of a pneumatic air tool.

FLORENCE A. CARPENTER.

are primary in soft tissues and secondary in bone
 JEROME G FINDER MD

Freund E Unusual Cartilaginous Tumor Formation of the Skeleton *Arch Surg* 1936 33 1054

Four cases of cartilaginous tumor formation of the skeleton are reported. The tumor represented in part some unusual forms of otherwise well known conditions. There was one enchondroma of the shaft of the femur in a fifty five year old man, a single osteochondroma of the os calcis and multiple cartilaginous exostoses and in part an apparently rare form of a multiple intra articular tumor formation which to the author's knowledge has not yet been described in the literature. The last case was one of true intra articular osteochondroma which developed in more than one joint following a peculiar hyperplastic change in the joint cartilage. It was necessary to differentiate it from similar formations which develop in persons with hypertrophic arthritis and from other conditions usually considered as neoplastic changes of the joint capsule such as chondromatosis of the joints.

As is common in cases of cartilaginous tumor formation of the skeleton a considerable amount of bony tissue was present in addition to the cartilaginous material. It is justifiable to speak of a cartilaginous tumor despite the fact that in some instances the bony component is prevalent as the cartilaginous portion represents the real active element in the tumor and increases in size. The bony tissue replaces the cartilage and is therefore of secondary importance.

Duncan G A Skeletal and Extraskeletal Tuberculous Lesions Associated with Joint Tuberculosis *J Bone & Joint Surg* 1937 19 64

In a study of 555 patients of which 379 were proved to have joint tuberculosis and the remaining 176 presented probable evidence of spinal tuberculosis Duncan analyzes the instances of skeletal and extraskeletal tuberculous lesions as a complication of joint tuberculosis. The author emphasizes the fact that a negative von Pirquet or Mantoux test is of great value in excluding tuberculosis of the bones and joints and of the cases in which the history was available a family history of tuberculosis was given in 26 per cent and active pulmonary tuberculosis was found in 12 per cent. However the cases of active pulmonary tuberculosis appeared to be relatively benign in character. In 100 patients the tonsils were removed the indications being hypertrophy obstruction of the pharynx and recurrent attacks of tonsillitis and while the removal of the tonsils had no apparent effect on the healing of the joint lesions tuberculosis was found in the tonsil material of 24 per cent of the cases.

The incidence of tuberculous lesions of the genito urinary system is not high but should always be kept in mind. In the series studied 25 per cent of the cases showed involvement of the genito urinary

system and 57 per cent presented tuberculous skeletal or extraskeletal tuberculosis associated with joint tuberculosis.

The author advocates operative fusion as the best method of obtaining a satisfactory cure and believes that the likelihood of disseminating the disease by operation is still not proved. The mortality rate in the series reported was 8 per cent.

PAUL C. COLONNA MD

Ferguson L K Painful Shoulder *Ann Surg* 1937 105 243

The author divides the lesions under discussion into five clinical entities each one of which he believes arises from a definite and characteristic disease change in the tissues of the subacromial bursa or supraspinatus tendon.

Acute traumatic bursitis may arise from direct trauma to the shoulder region or from transmitted force which traumatizes the bursa between the humerus and the acromion. Clinical features are history of trauma with the pain in the shoulder noted especially on abduction. There is tenderness in a diffuse area over the tuberosity. The roentgenograms usually show no abnormal findings. Immobilization by adhesive strapping application of heat and later exercises within pain limits are the method of treatment.

Acute subdeltoid bursitis with calcification is a diagnosis which is made both on roentgen ray and clinical findings. The patient complains of intense pain in the shoulder region with acute tenderness over the greater tuberosity. Shoulder motion is impossible because of the pain produced. The roentgenogram shows a relatively large area of calcification over the greater tuberosity. The author believes that the cause of the patient's symptoms is the tension within the area of calcification. In these patients he has had good results from incision under local anesthesia. The soft tissues are separated down to the subdeltoid bursa. After opening the bursa the area of calcification is easily recognized. Immediate relief of pain is obtained from a small incision into the area of calcification. No attempt is made to excise the entire calcified material. The wound is closed. The patient is treated as an ambulatory case throughout. Immediate relief of pain is obtained and recovery is expected in one or two weeks.

Subacute bursitis with calcification is a diagnosis made also on the basis of roentgen ray and clinical findings. In these cases there is pain in the region of the shoulder which increases on abduction and is usually worse at night. But the pain is not nearly as intense or constant as in the acute variety. There is tenderness over the greater tuberosity and the roentgenogram shows an area of calcification in the suprapinatus tendon which is smaller than in the acute type and more likely to be above the greater tuberosity than along its lateral margin. Operation should be avoided in this group if the best results are to be obtained. The quickest results can be obtained

by injecting novocain into the bursa and into the region of the calcification. This procedure is supplemented with the use of heat and exercises after the more acute symptoms have subsided. Eventual recovery with disappearance of the calcification takes place over a period of several weeks.

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FLORENCE A. CARPENTER.

Logroscino D and Dotti E. The Vascularity and Pathology of the Acetabulum (Vascolarizzazione e patologia della cavità cotiloide). *Chir d organi di movimento* 1936 22 285

Due to the fact that all efforts have been spent on the study of the head and neck of the femur the circulation of the acetabulum has apparently been completely neglected. For this reason the authors took up the study of the arterial supply of the acetabulum. As far as is known this type of investigation has never been carried out before.

The authors undertook to study the following:

1. The blood supply of the acetabulum through the various ages and its eventual modifications in the adult.

2. The explanation of the pathogenesis of different anatomicopathological entities of the acetabulum and the trophic changes which occur in this region as a consequence of either congenital or acquired changes of the blood supply.

3. The least traumatic approach to the hip and also the causes of failures and successes of the different methods of treatment of diseased conditions.

Cadavers from four months to sixty years of age were studied.

In all 40 preparations were examined. Injections of radio opaque substances were made into the arteries and roentgenograms were taken and then careful dissection was performed.

The arteries of the acetabulum were found to be variable.

The principal sources of the circular acetabular blood supply were the superior and inferior gluteal arteries which supplied the superior and posterior portion of the acetabulum, the obturator the inferior portion and also the anterior and medial portions. Excellent illustrations are given.

Studies of clinical cases showed that diseases of the acetabulum always occur at the site of penetration of the nutrient arteries of the acetabulum. Tuberculosis always originates in these areas. In arthritis deformans the authors found that the osteophytes always occurred on the acetabular rim where there was a lack of adequate nutrient foramina. Traumatic arthritis of the hip according to these authors is caused by the injury to the blood supply of the corresponding parts.

Isthroductive congenital dislocations of the hip produce osteoarthritic changes similar to those caused by vascular interference from reduction regardless of whether it is operative or non operative.

In extra articular fusions of the hip or shelving operations of the acetabulum the authors have shown that the posterior superior margin of the acetabulum has the most favorable blood supply and therefore affords the best bone regeneration. For this reason all operations necessitating bone growth should be in this area. Careful clinical investigation bears out this contention.

The article is clearly illustrated throughout.

CARLO S. SCUDERI, M.D.

Karp M G. Koehlers Disease of the Tarsal Scaphoid. An End Result Study. *J Bone & Joint Surg* 1937 19 84

In an analysis of forty five cases of Koehlers disease treated at the Children's Hospital Boston the author found that the proportion of males to females was 65 to 1, and that the average age of the patient was four years and seven months. The majority of patients gave no history of trauma in this series, and the duration of the symptoms prior to the first examination shows no relation to the character of roentgenographic changes found. The usual early symptoms were pain accompanied by limp with localized swelling and tenderness over the dorsum of the foot. The author believes that there is definite evidence to support the theory that Koehler's disease is caused by defective development and states that the end result was the same regardless of the type of treatment or the absence of treatment. Recurrence of pain and limp was not infrequent during the course of the disease and took place as frequently in the patients with foot supports as in the untreated patients. In 19 cases complete regeneration of the scaphoid was noted. All of the latter apparently had normal feet presenting excellent weight bearing extremities.

The author also made a study of the normal development of the tarsal scaphoid noting that the scaphoid makes its appearance much earlier in girls than in boys. Osseous nuclei were observed as early as the ninth month in girls, whereas in boys they were markedly retarded. The average age at which they appear in the roentgenograms may be considered to be between the eighteenth and twenty fourth months in girls and between the thirtieth month and the third year in boys. This may account for the condition being noted more commonly in boys as there appears to be a relationship between the time of appearance of an osseous nucleus and its configuration and density. The complete regeneration of the involved bone took place in these cases in an average of two and three quarters years and a normal foot usually developed. PAUL C. COLONNA, M.D.

FRACTURES AND DISLOCATIONS

Matti H. Operative Treatment of Habitual Dislocation of the Shoulder (Zur operativen Behandlung der habituellen Luxation des Schultergelenks). *Zentralbl f Chir* 1936 p 3011

The author considers the intra articular bone chip or shelf implantation as unnatural. In addition to subjecting the patient to the danger of wound infection adequate exposure is difficult. The extra capsular bone implantation of Steinmann is less evocative. In the procedure advocated by Perthes the wide detachment of the deltoid muscle is unnecessary. The suspension method by means of a strip of fascia lata is frequently followed by recurrence. The fascial strips may stretch. The method of Hymanowitsch consisting of transposition of the long head of the biceps tendon also has the disadvantage

vantage of opening into the joint. After a muscle-plasty according to the Clairmont-Ehrlich technique the author observed widespread necrosis of the deltoid muscle with transitory paralysis. As the review of Oetiker has brought out, the indirect methods generally give the best results. The humerus is secured to the joint chiefly by the internal and external rotators. Roepke succeeded in overcoming a habitual dislocation in an epileptic by reefing the subscapularis muscle. The same result can be effected by transposing the insertion of the subscapularis toward the external aspect of the intertubercular sulcus. The method was suggested by de Quervain.

The author has worked out a procedure, which is described and illustrated by a number of figures.

First an incision is made between the deltoid and pectoralis muscles and the aponeurosis of the pectoralis is notched. The lateral border of the short head of the biceps tendon and the coracobrachialis is retracted and the subscapularis is exposed by external rotation of the arm. The anterior humeral circumflex is ligated and then the subscapularis tendon is so detached from the lesser tubercle that a stump 5 mm wide remains attached to the bone. Dissection of the subscapularis from the joint capsule is accomplished bluntly, in part. At this stage several strong silk sutures are placed through the capsule. Then an arch-shaped osteoperiosteal flap external to the crest of the greater tubercle is formed. The capsular folds, produced by the previously placed silk sutures, are now fastened to the stump of the subscapularis tendon still attached to the bone, which reefs the capsule. Finally, the subscapularis is placed under the periosteocortical flap and secured by means of a nail. The arm is immobilized against the chest in inward rotation for three weeks and physical after-care is given thereafter. A moderate limitation of outward rotation should persist. All persons operated on regained the feeling of security in the arm. One patient could perform gymnastics again after six months. Eight of twelve patients had a cure lasting from three to twenty-one years. On the basis of two histories it was shown that despite a complicating wound infection from this procedure the joint itself was not invaded. (RATHCKE) JEPOME G FINDEP, M.D.

Welcker, E. R.: Results of Fascioplasty in Habitual Shoulder Dislocation, with Special Consideration of the Bone Canal-Wall Sclerosis. (Ergebnisse der Fascienzuegelplastik bei gewohnheitsmaessiger Schultererrenkung unter besonderer Beruecksichtigung der Knochenkanalwandsklerose). *Arch f. Klin. Chir.*, 1936, 187, 174.

Follow-up observations were made on patients who had been operated upon during the past twelve years according to the method of Loeffler and Schmieden. In all cases a free fascial transplantation was done, and the fascial sling taken from the iliotibial tract was used generally for fixation to the acromion through an adjacent extra-articular bony canal, in the manner described by Loeffler. The sling was secured, under the greatest tension while the arm was fully abducted. The arm was maintained in this position by a plaster cast for two or three weeks, and then treated with hot air, massage and exercises. Two epileptics suffered recurrence during severe seizures, the third patient brought on a new dislocation by a headlong dive, and the fourth remained free from recurrence for seven years. Practically all patients followed-up showed normal or only slightly limited mobility in the shoulder and none was drawing compensation.

One portion of the symptoms is attributed to chronic inflammatory joint processes, which followed especially injuries of the glenoid margins. In all cases of more than two years' duration, in which the patient claimed to have a good strong arm, the roentgenograms showed an outspoken thickening of bone around the bony canal in the humeral head. This may be accepted as evidence that the fascial suspension sling must have fulfilled its duty well. With longer intervals of rest the influence of pressure produces hypertrophy of the bone tissue for a period of several years, until the appearance of sclerosis. Two cases which demonstrated this particularly well were described in detail. The occasional arthritis deformans revealed itself in one case of injury from dislocation. The same degree of arthritis deformans also follows other processes, so that it is often difficult to differentiate in the final analysis the changes caused by injury from those caused by operation.

(K. ABEL) JEROME G FINDEP, M.D.

SURGERY OF THE BLOOD AND LYMPH SYSTEMS

BLOOD VESSELS

Kretschmann W. Results of the Treatment of Wounds of the Large Vessels (1) Primary Ligation (2) Primary Suture (3) Primary Amputation (4) Secondary Amputation (5) Conservative Treatment (Ergebnisse der Behandlung grosserer Gefässverletzungen. 1. Primäre Unterbindung 2. primäre Gefässnaht 3. primäre Amputation 4. sekundäre Amputation 5. konservative Behandlung) 1936 Leipzig Dissertation

After some introductory remarks on the present status of surgery in vascular injuries not taking into consideration the World War statistics of Franz in his Textbook on War Surgery Kretschmann reports seventy two cases from the Payr Clinic with interesting clinical records.

Sixty four per cent of the patients were cured 2 per cent died 3 per cent retained functional disturbances and 11 per cent required amputation. When these figures are compared with those of Franz, which concern only shot wounds it is interesting to note that in spite of better clinical facilities and faster transportation in peace time the mortality was about the same in peace as in war. Franz reports seventy seven cases from a German front Hospital with fifteen deaths a mortality of 19.5 per cent.

Conservative treatment was used in eight cases and resulted in seven deaths amputation for gangrene was required in one case. In forty four cases ligation resulted in thirty eight cures and five deaths and amputation for gangrene was required in one case. In nineteen cases suture resulted in eight cures and four deaths amputation for gangrene was required in five cases and in two cases functional disturbances remained. In one case primary amputation was done.

A comparison with the statistics of Franz is very interesting. The mortality from ligation as given by Kretschmann was 11.4 per cent while that given by Franz was 14.7 per cent and the mortality from suture was 21 per cent and 3.8 per cent respectively. Although the statistics are very different and do not permit a complete comparison it is nevertheless noteworthy that while there was a similar mortality for ligations the mortality for sutures was five times as high in peace times as in the War. Also in spite of suture 26 per cent of the patients treated during peace times required amputation whereas of the fifteen treated at the German front hospitals only two (13.5 per cent) required amputation. As the latter figures for comparison are similar this difference could be due only to the associated injuries. When we study the individual vascular wounds we see that injury of one of the main arteries of the forearm or leg never leads to gangrene but that when two are injured an attempt should be made

to suture at least one. In one case the subclavian artery was wounded and a simultaneous hemorrhage into the pleural cavity occurred but in spite of successful suture death resulted from blood loss. One suture of the axillary artery was successful. In three cases of wounds of the brachial artery recovery resulted from a suture ligation and removal of a thrombus after arterial trauma from a fracture. Two gun shot wounds of the hypogastric artery resulted fatally one after ligation and the other after tamponade. One wound of the superior gluteal artery was healed after ligation. Of special interest were three blunt wounds of the femoral artery which in spite of treatment resulted in death in from several hours to a day because of the severity of the associated injuries. There were seven wounds of the femur three due to gun shot and four to stabbing. One of the former caused death after operation. Three cases were cured after suture of the vessel and ligation of the injured femoral vein. Three cases which were treated by suture and ligation of the vein required amputation later two in the leg and one in the thigh. Of four cases of injury to the popliteal artery three required amputations and one developed dry gangrene of the toes. In the latter case both the artery and vein were wounded and both had to be sutured but later there was no pulse. In addition the injury had been caused by operation for genu valgum. In two instances only the artery was sutured and in one because of incorrect diagnosis due to an associated fracture the suture was faulty.

One case of injury to the cervical blood vessels resulted fatally because of hemorrhage from the internal and external carotid arteries. Of two cases of common carotid injury one recovered after suture and the other which was treated conservatively developed a hematoma and terminated fatally on account of asphyxia on the ninth day while being operated.

There was an interesting case of gun shot injury of the thoracic aorta with hemorrhage of 400 c cm in the pleural cavity. Suture failed so that ligation of the aorta was necessary the outcome was fatal. Similarly a gun shot wound of the abdominal aorta which was not operated resulted fatally. The case of Waldegans of successful suture of the abdominal aorta for a knife wound 1 cm long is cited. Ligation was successful in a case of knife wound of the right gastro epiploic artery and in a case of injury to the arteria hepatica propria which occurred when the patient was run over. Injury of the arteria hepatica propria frequently leads to necrosis of the liver when it does not occur there is usually a very anomalous distribution of the vessels. Two cases of portal vein injury ended fatally. One case of gun shot wound of the inferior vena cava recovered after suture. Other cases in which cure was obtained are

described, and Kleinschmidt's advice is repeated: the inferior vena cava may be ligated below the renal veins, but care is necessary to avoid cutting through the vein while ligating; therefore strips of fascia or broad linen bands should be used for this purpose (FRANZ) JACOB E. KLEIN, M.D.

Haxthausen, H.: The Pathogenesis of Ulcus Cruris Varicosum (Ueber die Pathogenese von Ulcus cruris varicosum) *Nord med Tidsskr*, 1936, p 1665

Contrary to the time-honored opinion that ulcus cruris varicosum develops as a result of stasis of the small cutaneous blood-vessels, the author has determined that this is not at all the case, and that the "cutaneous nutrition" is not lowered. In proof of this assertion is the fact that with a change of body posture of the patient, such as from the standing to the lying-down position, no change in skin temperature results. In place of this there is a slowing-up of the blood current in the large varicose veins, in fact in many parts of the veins the current may be reversed. In the vena saphena magna there may be stasis as well as change in the direction of the blood current. The author has demonstrated the reversal of the blood current experimentally by injecting a 20 per cent glucose solution into the large saphenous vein in a patient with a positive Trendelenburg sign and immediately withdrawing some blood through a superficial cutaneous incision over the malleolus. An increase of the blood-sugar values was found. The author seeks to explain the development of varicose ulcer as follows.

Stasis in the large venous trunks has little immediate significance in this condition. The cause of the important circulatory alterations are to be sought rather in the peripheral vascular regions. The vitality and power of resistance of the skin towards trauma and infection is lowered from such disturbances while the blood supply to the skin remains the same. An important factor is the increase in the pressure of the blood, which does not remain localized to the large veins, but extends into the capillaries. While normally the colloid-osmotic pressure in the blood plasma is at least as high as the

blood pressure itself thereby preventing extravasation of fluids from the vessels into the surrounding tissues, with an increase in the capillary blood pressures this osmotic pressure is no longer adequate and a filtration-edema develops in the tissues. If at the same time there is insufficiency of the muscle pump together with faulty closure of the venous valves, the capillary blood pressure will increase with body activity. Therefore, in the individual with varicosities the possibility of filtration-edema of the lower leg is much greater than in normal persons. The author was able to demonstrate this experimentally. In the normal individual such crural edema is easily and quickly dispelled by exercise, but in the varicose patient this is not true. Severe damage to the vitality of the skin with accompanying degenerative changes in the connective tissues gradually develops from the persistent edema with its constant pressure on the tissues. This "edema theory" of the cause of crural varicose ulcer agrees essentially with clinical observations. These considerations should therefore determine the methods of treatment. By lowering the capillary pressure of the skin, particularly in the vicinity of the ulcer, which is done most simply by having the patient rest in bed, the factor of hydrostatic pressure is removed. Another method consists in increasing the venous pump effect by means of compressive dressings such as elastic bandages and elastic stockings. The pressure prevents the venous back-flow and at the same time prevents the development of the edema. A prerequisite to a good result is the presence of functionally efficient deep veins, which may be determined by the Trendelenburg test. With lengthy periods of bed-rest attention must be given to the preservation of the musculature. Massage and active movements such as, walking motions while lying down with the Wulff apparatus are recommended. Among the author's material were many patients with deformities of the foot such as flat-foot and ankylosis of the superior tarsal or talotibial joint; and for this reason the author directs attention to the possibility of relationship between these anomalies and ulcus cruris.

(HAAGEN) JOHN W. BRENNAN, M.D.

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE, POSTOPERATIVE TREATMENT

Gratz C M Biomechanical Studies of Fibrous
Tissues Applied to Fascial Surgery *Arch Surg*
1937 34 461

The fascial planes vary in thickness according to their location and function and invest the higher structures i.e. muscles cords tendons bursae vessels nerves viscera joints and even cartilage and bone. Where support is the chief function fascia develops where special adaptation of form becomes necessary for the transmission of power from the muscles to their respective insertion in other portions of the locomotor apparatus tendons and ligaments are found.

There have been found two principal planes of fascia the subserous and the subcutaneous. Since fascia is subjected to varying factors of stress its final adult form has probably been determined by functional variations. Fascia lata was selected for the study of the fascial planes because of its importance in low back pain and because of its extensive use in the transplantation of living sutures. The function of fascia lata is muscular support as well as the transmission of varying directional stresses in the thigh. It conforms histologically to these functions being a composite of fibers arranged in varying planes.

For the second group of fibrous connective tissues the tendons were chosen. Their prime function is the transmission of power developed in the muscles to their osseous insertions. The tendo achillis is a good example of this group. Other tendons have a more complicated function for example the flexor longus digitorum transmits power around one joint to multiple osseous insertions. As the function is necessarily more complex it would be expected that its structure is more complicated than that of the tendo achillis.

The fourth tissue studied the erector spinae has a supportive rather than a kinetic function and is of prime importance in low back pain.

The tensile strength and elasticity of the fibrous tissues from a cross section of mammals are presented in engineering units. Tensile stress results from the application of load which is parallel to the direction of the fibres. When the load is in excess of the strength of the tissue the fibres rupture. The point at which they rupture marks the maximum tensile strength of the tissue. When stress is not parallel to the direction of the fibres a shearing stress results.

Elasticity is that property of a body which causes it to resist deformation and afterwards recover its original size and shape. It is not the ability to stretch but rather the ability to recover the original form.

Determinations of the proportional limit of the tissues studied and the elasticity measured in terms of Young's modulus are presented. The proportional limit of biological material is regarded as a measure of the physiological range of elasticity and probably indicates the dividing line between stress which causes no permanent damage to fibrous tissues and stress which causes intrinsic changes and permanent impairment of function.

The similarity between species makes such determinations pertinent to man and the similarity between tendons and fascia makes a large proportion of the research and clinical work on tendons pertinent to operations involving the fascia.

The study of fibrous tissues presented shows definite adaptations of form to function. Shearing stress and trauma markedly diminish the physical strength of the tissues. Their effect is graphically portrayed. The findings are clinically applied to devise a physiological technique of fascial transplantation. The facts given permit the presentation of definite principles to guide in the selection of cases and tissues suitable for fascial transplantation.

Brief reference is made to other fields in which these findings are of value. Particular reference is made to the rôle of the fascial planes in the mechanics of the soft tissues of the locomotor apparatus. The functional mechanics of the soft structures are considered in relation to the rôle of fascial adhesions in low back pain. Reference is made to the normal mesothelial covering of the fascia and its changes in low back pain and arthritis.

It is believed that chronic infective processes may be as closely associated with the fascial spaces as acute infections have been shown to be.

SAMUEL KAHN M.D.

ANTISEPTIC SURGERY TREATMENT OF WOUNDS AND INFECTIONS

Panton P N The Specific Treatment of Staphylococcal Infections *Proc Roy Soc Med Lond*
1937 30 515

The specific treatment of staphylococcal infections of the skin such as boils and carbuncles requires the development of an active immunity against the organism. Recently a combination of vaccines and toxoid has been used to accomplish this but as yet there is no specific therapy of any value.

The antigenic potency of a vaccine does not depend at all upon the suspended bacteria but solely upon the toxins carried over with them therefore the amount of antigen is not estimated by a bacterial count.

Patients recently infected by staphylococci usually have a slightly higher antitoxic titer in their sera than normal individuals. Treatment with toxoid

injections increases the titer of antitoxins in the blood. However, immunity is more than a balance between toxin and antitoxin as these patients may still continue to acquire staphylococcal infections. It appears that they become sensitized to the infecting agent and more susceptible to the disease. The author recommends the use of toxoid over a short period of time. In a case of furunculosis 0.1 c.c. of toxoid (one in ten dilution) is given as an initial dose, which dose is increased up to 0.5 c.c. of undiluted toxoid in three weeks. If no fresh lesions appear no more toxoid is given. If a new lesion appears only one small dose is given.

MANUEL E. LICHTENSTEIN, M.D.

Anghelescu, V., Crivetz, D., Pascal, I., and Lazarescu, V.: Comparative Investigations Regarding Serotherapy, Ultraviolet Radiations, and Chemotherapy of Erysipelas (Vergleichende Untersuchungen ueber Serotherapie, ultraviolette Bestrahlung und Chemotherapie des Erysipels) *Deutsche med. Wchnschr.*, 1936, 2, 1639.

At the authors' clinic 631 cases of erysipelas were treated during the last two years. The value of different therapeutic measures was tried out by using them in a number of very severe cases. Streptococcus serum, ultraviolet radiation, and prontosil were tried. To obtain a most objective decision it was necessary to treat the patients from the earliest beginning of the disease. A thorough history was taken and especial note was taken of the time of onset of the angina, fever, and eruption. In this way spontaneous cure could not be confused with the effect of the therapeutic measure which was employed.

Streptococcus serum was administered in seventeen cases of facial erysipelas. One hundred cubic centimeters were given every day for from six to eight days. There was no sudden cessation of the temperature, no definite improvement in the clinical picture, and no prevention of recurrence, but serum sickness resulted quite often. The duration of the disease was usually from twelve to fourteen days. Therefore, the cure could not be considered the result of the treatment.

Ultraviolet ray treatment with the quartz lamp was given in twenty cases. Each treatment was twenty minutes in length and was given at a focal distance of 20 cm. Appreciable improvement followed. The course of the rash and the fever was somewhat shorter than with serum therapy. It lasted for an average of about eight days. The disadvantages of this treatment are that it cannot be given to scalp containing hair, and the individual treatments last too long if all affected areas are to be irradiated.

Twelve patients were treated with prontosil. Eight tablets were given per os in twenty-four hours for several days. There was a rapid drop in temperature in one or two days. The rash stopped immediately and rapid improvement in the clinical picture followed. Hospitalization was usually not longer

than six days. The prontosil treatment was simple and the product was well tolerated.

The different effect of the three methods of treatment are illustrated with fever curves.

(E. WILLMS) LFO A. JUNEKE, M.D.

ANESTHESIA

Lotz, H. K.: Report of Anesthetic Deaths. *Arch. Chir.*, 1937, 16, 70.

This report embraces every death from anesthesia that has been so classified in the Homeopathic Hospital since July 1, 1917, to October 1, 1936, and one that occurred in another institution. There were 32,883 anesthetic administrations, not including local blocks and infiltration anesthetics, of which the author personally administered 15,000.

Seventeen cases in which death occurred during anesthesia or at a time which showed that it had been hastened by the anesthesia are included. There were only four autopsies performed. However, after reading the case histories it was doubtful if more than five deaths could be attributed to the anesthesia: two to ether, and one each to nitrous oxide, spinal, and avertin anesthesia.

In eleven of the cases reported, the author gave the anesthetic. He classifies the anesthetic deaths more liberally, and attributes four to nitrous oxide, three to ether, two to spinal, and one to avertin anesthesia.

From a statistical standpoint some of the deaths could have been avoided if the patients had been operated upon when they were in better condition, or not at all. However, the author wishes to have the article interpreted as an acknowledgment of the unfortunate calamities that come to those attempting to relieve suffering and aid surgery.

JOHN E. KIRKPATRICK, M.D.

Lagergren, K. A.: Experiences and Viewpoints Regarding Fractional Spinal Anesthesia According to Sebrechts (Erfahrungen und Gesichtspunkte betreffs der fraktionierten Spinalanästhesie nach Sebrechts) *Acta chirurg. Scand.* 1937, 79, 219.

In a brief historical review the author gives the most important steps in the development of spinal anesthesia by Corning, Bier, Fargue, Pitkin, Jones, Kirschner, and Sebrechts.

In recent years three factors in particular have contributed to the renaissance of spinal anesthesia: (1) the acknowledgment of the fact that individual dosage is necessary in spinal anesthesia as well as in most other forms of anesthesia; (2) the creation of methods which permit the adaptation of the anesthetic solution to individual requirements; and (3) the explanation of the nature of spinal shock by extensive experimental investigations. These factors have enabled anesthetization to be carried out with greater confidence, and greater possibilities have been created for the prevention and control of the dangerous factors associated with spinal anesthesia.

Sebrechts is the chief advocate of applying the principles of individual dosage to spinal anesthesia he has also been the instrument of important experimental investigations by de Rom. The principles of Sebrechts' method of fractional dosage as well as the practical details of the method are given. The clinical observations of 1000 cases of spinal anesthesia with percain 1:1500 according to Jones are based on this method. The author reports these observations. They are exceedingly favorable in all essentials and as a result spinal anesthesia has been introduced as a routine method in all major subdural phragmatic operations in the surgical clinic under the charge of Pallin.

The questions of contra indications to spinal anesthesia and of a more extensive use of high anesthesia in cases of impaired general condition are taken up. Complications and dangers that may arise in spinal anesthesia are discussed and special attention is given to postanesthetic headache and spinal shock. The therapeutic usefulness of spinal anesthesia has been observed in certain cases of ileus in which condition particular care is necessary because of augmented anesthetic sensibility.

There was no death among the 1000 cases that could be connected directly or indirectly with the spinal anesthesia. More serious shock symptoms were present when the prescribed mode of administration was not followed.

Of the methods of spinal anesthetization in use at present the author believes that giving a weak solution of percain in fractional doses according to Sebrechts is the best method to approach the ideal dose necessary for a fully satisfactory anesthesia. It is believed to be also the best method available at the present time to replace the single preestimated dosage which is dangerous to rachisensibles, and sometimes fails because of incomplete anesthesia in the cases of rachisistants.

Robbins B H. Quantitating Cyclopropane in Air and Blood. *Anes & Anal* 1937 16 93

Cyclopropane a gas at ordinary temperature was discovered by Freund in 1882. In 1929 Lucas and Henderson discovered its anesthetic properties. It is becoming widely employed for human anesthesia.

Studies have been made on the concentration of the gas in inspired air required for anesthesia by Henderson and Lucas, Seever and others and Waters and Schmidt. In a review of the literature the author has found no reports in which studies have been made on the concentrations of cyclopropane in the blood necessary for anesthesia or for death.

The method of oxidation by iodine pentoxide the procedure of analysis and the physicochemical properties of cyclopropane are presented in detail with equations, tables and graphs. The solubility of cyclopropane in blood increases with the fat content of the plasma. The solubility in the cells of the blood is about two and one half times that in the plasma.

Animal experiments were devised to determine the cyclopropane concentrations necessary for anesthesia, loss of reflexes and respiratory arrest. Accurate standardized gas concentrations were made and analyzed in the oxidation train according to the procedure described. In the animals there was a regular order of loss of reflexes. The knee jerk which is abolished in ether anesthesia at a much higher concentration than abdominal rigidity is the first to disappear. The corneal reflex follows next with an 18 per cent mixture. The abdomen is well relaxed with 22 per cent. The lid or wink reflex is abolished with 27 per cent and the costal muscles lose their activity with an average of 33 per cent. Respiratory arrest was produced at 36 per cent. These were average values for the seventeen dogs.

The variation in the concentration of cyclopropane required to produce the same stage of anesthesia in the different dogs was not much greater than similar variations with ether anesthesia. The values differed from the average only by as much as 6 per cent.

After the animal had been on a fixed concentration of cyclopropane for fifteen minutes or longer the cyclopropane content of the venous blood was equal to that of the arterial blood.

The elimination of cyclopropane was much more rapid than the elimination of ether reported by Ronzoni because of the difference in the distribution ratios of these agents in air and blood mixtures.

JOHN E. KIRKPATRICK, M.D.

PHYSICOCHEMICAL METHODS IN SURGERY

ROENTGENOLOGY

Engelstad, R. B.: The Pulmonary Reaction to Roentgen Irradiation in Man *Acta radiol*, 1937, 18 32

After a short review of experimental pulmonary changes produced in rabbits by roentgen irradiation, the author discusses thirty-six cases of pulmonary lesions in man. These lesions were the result of irradiation in twenty-one cases of cancer of the breast, ten of cancer of the esophagus, four of pulmonary metastasis of extrapulmonary tumors, and one of cancer of the lung.

The frequency of the irradiation reaction in the lungs was 5.4 per cent in cancer of the breast and 20.4 per cent in cancer of the esophagus. Very large doses of roentgen or radium rays had been used in almost all the cases in which an irradiation reaction was demonstrated in the lungs. When an epidermical dose is given in irradiation of the thorax and particularly when several fields are irradiated, there is a possibility that the lungs may be injured.

The radiosensitivity of the human lung seems to correspond rather well with that of the rabbit. The histological findings also seem to be similar to those in rabbits. The subjective, physical, and roentgenological symptoms are not very characteristic, and a prolonged period of observation is necessary in order to make the diagnosis. Fatal lung injuries due to irradiation have not been observed.

THEODORE J. WACHOWSKI, M.D.

RADIUM

Martin, P.: The Effect on the Eye of Radium Used for Malignant Disease in the Neighborhood. *Brit. M. J.*, 1937, 1 651

A survey conducted since 1931 of patients treated with radium around the eye at the University College Hospital revealed that a series of morbid changes may occur and lead progressively to necrosis of the cornea and loss of the eye. The cases treated included skin carcinoma of the lids, meningioma, and carcinoma or sarcoma of the maxilla. For the first two years treatment consisted of interstitial or surface irradiation with needles of low linear intensity, a filter of 0.5 mm. and later 0.8 mm. of platinum. Since 1933 a 1-gram radium unit has been available.

The late results in a few cases treated ten years previously with radium needles of high linear intensity and light screenage are also considered in this article.

In reviewing the morbid changes, it may be said that when using interstitial irradiation around the eye, the main effect falls on the conjunctiva and skin of the lids, as the eye itself, with the possible exception of the lens, is somewhat radioresistant. The

early conjunctival effects consist of edema, hyperemia, and serous discharge which begin within a few hours after the application of the needles, reach their maximum in from five to eight days, and fade slowly to normal within three weeks. Pain is not a feature even of severe conjunctival reaction. When the eye is irradiated by the 1-gram radium bomb, the conjunctival reaction is slight, reaches its maximum in from sixteen to eighteen days, and in general takes the same course as the cutaneous reaction. The late conjunctival effects consist of scarring, obliteration of the fornices, thickening of the entire conjunctiva, injection of the conjunctival vessels, and cicatricial ectropion. After irradiation with the bomb analogous changes may occur but they are of a minor character.

The cornea and iris are affected only by relatively intense irradiation. The chief morbid change in the cornea is ulceration which may occur directly from the irradiation or indirectly from secondary irradiation effects, such as dryness of the lacrimal glands, or exposure due to massive edema in the early, and ectropion in the late, stages of irradiation. The necrosis of the cornea appears usually as a delayed reaction about three months after the irradiation, but may appear at any time depending on the dose used. As a rule it is associated with necrosis of the skin or bones. Clinically, in the beginning it bears a strong resemblance to neuroparalytic keratitis, then desquamation gradually sets in and finally the ulceration appears and leads eventually to perforation. Pain is not an outstanding feature of radium necrosis, even when the ulcer is large or a perforation has already taken place. The secondary infection does not set in until late, so that there is a delay in infection of the whole eye.

The radium cataract as a rule appears two years or more after irradiation. In the typical form, it is a posterior cortical cataract, but when it matures it possesses no special features and is amenable to operative treatment.

No changes from the irradiation have been seen in the fundus, and in no case was the other eye damaged or involved in any type of radium reaction.

For management of a case in which damage to an eye may occur the author recommends that whenever interstitial irradiation is used the cornea be protected by first stitching the lids together. The degree to which the conjunctiva may swell is thus limited by the pressure of the lids. The eye is washed twice a day with normal saline solution without disturbance of the stitch holding the lids, which is kept in place until the reaction is definitely fading. If the stitch has been removed too soon an attempt must be made to close the eye by strapping the lids together. When using the 1-gram bomb, the reaction is so slight that stitching or strapping is unnecessary. If pain sets in in a stitched eye, especially at night

when the pupil is contracted in sleep and if homatropine produces relief iritis should be suspected. In such instances treatment by atropine is instituted. The development of corneal necrosis is checked by weekly examinations during the first six months. Diminution of sensation of the cornea in the sector exposed to the maximum irradiation is always a suspicious sign. The staining with fluorescein will help to detect shallow areas of necrosis which give rise to no clinical symptoms. At this early stage the cornea may heal with palliative treatment alone. Later tarsorrhaphy may be necessary and may take from four to eight months. If the cornea has already perforated it is useless to try to save the eye.

T. LEUCUNA M.D.

MISCELLANEOUS

Cockcroft J. D. High Velocity Positive Ions. *Brit J Radiol* 1937 10 159

This article represents the seventeenth Mackenzie Davidson Lecture which was delivered December 4, 1936 at the annual British Congress of Radiology. It deals with the application of high velocity positive ions to the transmutation of atomic nuclei and the production of artificial radio activity.

The first indications that atoms could be permanently transmuted came with the discovery of radio activity when it was found that the heaviest elements uranium, actinium and thorium were spontaneously changing into lighter elements and finally some forms of lead. Later an instability of potassium, rubidium and to a slight extent samarium was observed also. For the explanation of these natural processes the Rutherford Bohr theory of the atom was applied. This theory is that the atom of an element possesses a positively charged core the nucleus and an outer electronic structure and that one electron is attracted for each unit of positive charge on the nucleus. A transmutation of an element can only occur if the central nucleus is changed.

In 1919 Rutherford using charged helium nuclei (ejected from members of the radio active series) as a source of projectiles was able to penetrate the nuclei of nitrogen and change them into permanent oxygen nuclei (${}^{14}_7\text{N} + {}^4_2\text{He} \rightarrow {}^{18}_8\text{O} + {}^1_1\text{H}$). The upper figures give the masses of the nuclei the lower figures the charge.

Transmutation of this type to an element three units heavier can now be produced in most of the elements up to an atomic weight of about forty. Above that the transmutation is increasingly more difficult and therefore other methods had to be sought.

In 1929 the author commenced to build an apparatus for the use of high speed nuclei of hydrogen or protons as a source of projectiles. The principles of design of such an apparatus up to about 700 000

volts are described in the text. The Wilson cloud chamber was employed mostly for the detection of the products of transmutation emitted from the target of the apparatus. In work of this type the choice of projectiles is not limited to nuclei of ordinary hydrogen. More recently, after the discovery of the heavy isotope of hydrogen nuclei of such hydrogen are being used extensively, the projectiles being known as deuterons. If for example a target of lithium placed inside a Wilson chamber is bombarded by deuterons the lithium nucleus is penetrated by these particles and an unstable nucleus of ${}^8\text{Be}$ is formed which can break up into two helium nuclei (${}^6_3\text{Li} + {}^2_1\text{H} \rightarrow {}^8_4\text{Be} \rightarrow {}^4_2\text{He} + {}^4_2\text{He}$) or into a lithium

of mass 7 and an ordinary hydrogen (${}^7_3\text{Li} + {}^1_1\text{H}$). But the lithium of mass 7 can also undergo several transmutations under the influence of deuteron bombardment. In one beryllium of mass 8 is produced together with a neutron in another a helium nuclei and a neutron and in a third a new and most interesting type of lithium of mass 8 which is apparently radio active. This latter constitutes an example of the artificially produced radio activity of the ordinary elements discovered by Curie and Joliot in 1932. It may be mentioned that as a result of the work of the last few years it appears now that every element has one or more radio active forms which may be produced by using as projectiles neutrons protons deuterons or α particles the essential factor being penetration of the nucleus.

To produce transmutation of the heaviest elements by protons or deuterons exceedingly high energies are required. The direct application of high voltages (6 000 000 volts and above) is exceedingly difficult since buildings of from 70 to 100 ft in height are necessary to house the generators. Fortunately the apparatus of Lawrence the cyclotron permits the acceleration of charged particles in stages as they move in a spiral path in a magnetic field. Quite recently one of the triumphs of this particular apparatus has been the conversion of bismuth to Radium E. Although the activity of this radium is still exceedingly weak larger yields may be anticipated in the future. In the case of lighter elements the sources are much stronger. For example the radiosodium produced at 5 000 000 volts gives an activity of 20 millicuries per 1 micro ampere of deuterons and 80 micro amperes of deuterons are already obtainable.

An alternative method of producing radio active elements is the use of neutrons described by Dr Chadwick their discoverer in a previous Mackenzie Davidson Lecture. This method may also be extended over the whole periodic table.

In concluding his article the author appends an up to-date table of radio-active isotopes.

T. LEUCUNA M.D.

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Shore, B. R.: The Care and Cure of Cancer Patients.
Ann Surg, 1937, 105 442

Of 744 consecutive patients with cancer who were admitted to the medical and surgical wards of St. Luke's Hospital, New York, only 182 (24.4 per cent) were operable, whereas of 255 private patients with cancer, 137 (53 per cent) were operable. Most private patients present themselves for diagnosis and treatment earlier.

Of 182 patients who were operated upon with the idea of cure, 31 (16.9 per cent) died immediately after the operation and only 151 (20.2 per cent of the original 744) were discharged from the hospital with the possibility of surviving for a period of years. Of 110 of the latter who were followed up, 58 had survived five years. The latter represent only 7.8 per cent of the total number of patients treated, but 37 per cent of those surviving radical operations. Seventy-seven of the patients followed up had lived three years.

In conclusion the author states that no patient with cancer is ever too ill or has a cancer too advanced for some form of physical or psychic therapy, and at the present time no physician is able to forecast correctly the duration of life in all cases. The biology of the tumor and the biology of the patient are two absolutely unknown qualities and quantities present in all cases of cancer.

JOSEPH K. NARAT, M.D.

Géry, L.: A Research on the Causes of Abnormal Cicatrization (Recherche des causes de cicatrisation anormale) *Bull et mém Soc d chirurgiens de Par*, 1936, 28 405

In this rather extensive article Géry reviews at length the changes that take place in wounds: the tissue reaction that occurs in the dermis, the epidermis, and the subcutaneous tissue, and the rôle that each type of cell plays in these changes.

Cicatrization is repair which can only be obtained by sclerosis, and all sclerosed tissue is retractile. The sclerosis which inevitably follows a surgical wound is left after the absorption of the granulation tissue. The ideal scar is one in which there is only a thin layer of sclerosed tissue which is incapable of deforming by its retraction or overgrowth the tissue of the region in which it is situated. In order to obtain such a result the operation must leave in the wound the minimum amount of either endogenous or exogenous material which requires absorption. This result is achieved by the operator's making clean incisions with a very sharp instrument. Handling of the tissue, and crushing or trauma with instruments must be avoided. The use of scissors should be reserved for occasions when it is absolutely

necessary. The skin surface should be replaced carefully in exact apposition and the amount of suture material should be kept at the lowest possible level. Hemostasis must be perfect.

Géry illustrates the necessary steps in skin grafting. Several photographs of patients are included.
MARSH W. POOLE, M.D.

Peer, L. A., and Paddock, R.: Histological Studies on the Fate of Deeply Implanted Dermal Grafts: Observations on Sections of Implants Buried from One Week to One Year. *Arch. Surg*, 1937, 34: 268

In order to determine the advisability of filling a depression by burying a free section of dermis and fat beneath the skin, the authors conducted a series of experiments. An elliptical section of skin and subcutaneous fat was removed from the abdomen of a number of patients on whom a rib-graft operation was performed for the repair of a saddle nose. The epidermis was shaved from each section, and the remaining dermis and fat were inserted beneath the skin of the chest with the dermis outermost. At intervals of seven, fourteen, and twenty-one days, two, seven and twelve months, the implants were excised, together with the overlying skin of the chest, and examined histologically. The findings were as follows:

The dermal graft (with epidermis apparently removed) when taken from the skin of the abdomen as a free autogenous graft and inserted beneath the skin of the chest remained in place and fused with the surrounding connective tissue.

In the majority of the sections some epidermis remained in spite of attempts to remove it completely. This remaining epidermis formed closed cyst cavities of microscopic size which contained bony material and fragments of hairs.

In the sections removed later (after seven months to one year) bony material was found in the cavities of microscopic size surrounded by granulation tissue without epithelial lining.

Sebaceous glands were noted only in the implants removed after one week.

Hair follicles were observed only in the implants buried up to three weeks, inclusive.

Sweat glands were seen in all sections, but in the implants removed later they were in the process of degeneration and fibrous replacement.

Granulation tissue surrounding the implant was of the chronic inflammatory type containing lymphocytes, macrophages, epithelioid cells, and often giant cells, in some cases with the formation of granulomatous nodules.

In the granulomatous tissue surrounding the implant and at times, within the implant, bodies resembling hairs and fragments of hairs were observed within the giant cells and nodules.

JOHN H. GARLOCK, M.D.

GENERAL BACTERIAL PROTOZOAN AND PARASITIC INFECTIONS

Shwartzman, G. and Goldman J. L. Streptococcus Hemolyticus Bacteremia A Study of 168 Cases *Arch Surg* 1937, 34 82

The authors present an analysis of 168 cases of streptococcus hemolyticus bacteremia in which positive blood cultures were obtained. These cases were observed at the Mt. Sinai Hospital, New York during five and one half years following October 1926.

The cases were classified according to the portal of entry of the organism.

1 Streptococcus hemolyticus bacteremia following peripheral infections erysipelas infections of the upper respiratory tract thrombosis of the lateral sinus acute otitis media with meningitis, pulmonary infections osseous and articular infections surgical infections and gynecological infections.

2 Streptococcus hemolyticus bacteremia associated with leukemia agranulocytic anemia neoplasms diabetes rheumatic cardiovascular disease tuberculosis and unknown causes. In this group no direct relationship could be established between the associated disease and the bacteremia.

Peripheral infections included all the cases in which the infection developed in an injury to the epidermis. In the 22 cases the general mortality rate was 36 per cent. It was higher in the patients beyond the fourth decade. There was no seasonal variation in incidence or virulence. Lesions with the portal of entry on the extremities led to multiple and contiguous infections. Infections of the head and trunk remained localized. The development of a metastatic lesion (in the lungs bones joints meninges pericardium, kidneys) caused death in 71.5 per cent of the cases. In the blood cultures of the patients who died growth was obtained in all the fluid and solid mediums. The bacteria were limited to fluid mediums only in the blood cultures of the patients who recovered (10 of 17).

Erysipelas was associated with bacteremia in 7 cases. In the primary erysipelas the mortality was 50 per cent in the secondary type it was 20 per cent.

Infection of the upper respiratory tract was associated with bacteremia in 23 cases. The mortality rate was 34 per cent. It occurred chiefly in children during the winter and spring months. Osteomyelitis developed in only one bone in all 10 patients in this group. The blood cultures of those who recovered were predominantly positive in the fluid mediums.

In thrombosis of the lateral sinus data as to blood cultures were included for a seven year period. Operations for thrombosis of the lateral sinus were performed on 63 patients. The pre-operative blood cultures were positive in 96.7 per cent of the cases. The further analysis of this group concerns only 43 of the cases which were observed during the period originally chosen for this report. The mortality rate was 37 per cent. In most of the cases the patient was in the early years of life. There was no seasonal incidence. The main metastatic foci occurred in the

kidneys lungs bones and joints and brain involve ment was the most common fatal complication.

Acute otitis media with meningitis occurred in 4 cases all terminating fatally. The meningitis was considered the source of the invasion. Numerous streptococci were found in the blood stream. All of the cases occurred in the winter and spring.

Pulmonary infections occurred in 8 cases, all terminating fatally. The primary infections were bronchopneumonia pneumonia and abscess of the lung. The cases occurred in the winter and spring. All blood cultures showed growths in all mediums.

Osseous and articular infections occurred in 8 cases with a mortality rate of over 62 per cent. There were both a higher mortality and a higher incidence in infancy. The osseous infections were considered the primary foci. Distant metastases such as bronchopneumonia abscesses of distant soft parts and meningitis were conspicuous.

Surgical (postoperative) infections associated with streptococcus hemolyticus bacteremia occurred in 20 cases following various surgical procedures such as major operations on the genito urinary and gastro intestinal tracts rhinoidectomy and certain minor operations. A high mortality rate of 85 per cent was found. The metastatic and contiguous infections were peritonitis bronchopneumonia endocarditis and erysipelas.

Gynecological infections associated with bacteremia occurred in 10 cases. The bacteremia developed following a primary infection of the uterus and adnexa. There was a mortality of 60 per cent. In this small group of cases the blood cultures of the 4 patients who recovered showed growth only in the fluid mediums.

In the second group 22 cases of streptococcus hemolyticus bacteremia occurred in association with one of several miscellaneous diseases. The primary disease was usually of a debilitating type and invasion of the blood stream occurred secondarily, often shortly after death in patients with markedly diminished resistance. There was a mortality of about 74 per cent. The organisms of the patients who died grew in all the mediums and those of the 4 who recovered grew only in the fluid mediums.

The question whether the blood stream is invaded by streptococci from lesions of erysipelas is considered in detail. The authors try to differentiate between primary and secondary erysipelas in their series. They believe it is significant that they obtained a growth of streptococcus hemolyticus in 2 of 18 cases of primary facial erysipelas.

In conclusion the enrichment of the blood-culture mediums and the methods employed were largely responsible for the high incidence of positive streptococcus hemolyticus cultures especially when limited to fluid mediums.

The quantitative estimation of the number of hemolytic streptococci in the blood stream (growth of the bacteria in both solid and fluid mediums or in fluid mediums only) was of both diagnostic and prognostic value.

The data given in this article disclose that in contrast to non-hemolytic streptococci (alpha and gamma), hemolytic streptococci (beta) when found in the blood stream, even in extremely small numbers, are of important clinical significance in the diagnosis and prognosis, and as an indication for surgical intervention.

The article includes a review of the literature, and a detailed discussion and technical description of methods employed for blood culture

JOHN E. KIRKPATRICK, M D

DUCTLESS GLANDS

Fisher, C.: The Site of Formation of the Posterior Lobe Hormones. *Endocrinology*, 1937, 21 19

The atrophic posterior lobes of the pituitary glands of 4 cats with diabetes insipidus were studied with regard to their melanophore-expanding influence on the living frog. The results indicate that the pars intermedia of these glands was physiologically active as well as histologically intact. The author therefore concludes that absence of the pressor, antidiuretic, and oxytocic activities in glands of the same type as those used in this study is correlated with the degeneration of the pars nervosa, and that the latter must play a rôle in the elaboration of these components.

It is not known what elements of the posterior lobe of the pituitary gland are capable of secretory activity. One possibility is that the pituicytes play a rôle in the elaboration of the posterior lobe hormones. In the atrophic pars nervosa these glial cells appear to have degenerated. The fibers of the supra-opticohypophyseal tracts end around the pituicytes. They seem to exert a trophic influence on the latter for, when these fibers degenerate, the pituicytes also undergo degeneration. In view of the generally recognized fact that adrenalin is produced by the suprarenal medulla, an organ which is also of neural origin, the possibility that the pars nervosa may have an endocrine function is not astonishing.

JACOB M. MORA, M D

EXPERIMENTAL SURGERY

Orloff, G. A.: The Effect of Novocain Block on the Healing of Frozen Tissues. *Experimental Studies (Sur l'influence du blocage novocaïnique sur la guérison des tissus gelés. Investigations expérimentales)* *Lyon chir*, 1937, 34 20

Many surgeons using novocain infiltration or block for anesthesia have noted its therapeutic possibilities not only in neurogenic processes but also in

other destructive processes such as infections, burns, and trauma. It must be kept in mind that novocain exerts both a chemical and a mechanical effect. Besides leaving a residue in the tissues, it increases their acidity and thus stimulates cell regeneration. Gaza demonstrated that this drug has a more marked effect on the sympathetic than on the cerebrospinal nerves.

The author tested its effect on the healing of frozen tissues. He states that, according to the temperature and the duration of the exposure, freezing will cause more or less extensive destruction of the tissues. Vascular spasm occurs not only in the peripheral vessels but also in the main arterial trunks of the area involved with associated deep inflammatory changes. He carried his investigations on white male rats of the same age (six to eight months) and weight. The tails were subjected to ethyl chloride freezing for two minutes for a distance of 6 cm. from the distal end. The rest of the tail was protected by vaseline. After one and one-half minutes, the tail was usually so numb that it could be broken off like a stick. After two or three hours a vasomotor reaction set in with hyperemia of the frozen part. At the end of twenty-four hours there was considerable edema. This disappeared by the fifth to seventh day. By the eighth to tenth day function was lost and the process went on to gangrene of the frozen part, which was shed from the twenty-fifth to thirty-fifth day. The line of demarcation was hardly visible on the sixth and seventh day but showed quite plainly by the tenth to twelfth day.

In a control series of rats a 0.75 per cent solution of novocain in physiological salt solution was injected at varying intervals. The circuminjection was made subcutaneously from 2 to 2½ cm. from the root of the tail. From 4 to 5 injections were sufficient to complete the circular infiltration. When given during the first few hours after freezing, this treatment prevented destruction of the tissues in 85 per cent of the animals. In the 15 per cent in which necrosis developed after freezing in spite of novocain block, the necrotic process involved only about one-third of the frozen area. Novocain block applied before freezing had no apparent therapeutic effect. The best results were obtained when the treatment was given within from six to eight hours after the freezing. Later application up to twenty hours did not prevent necrosis, but activated the process of demarcation and detachment of the tissues. The effect was due, not to the mechanical action and resulting congestion, but to some action on the nervous system.

EDITH SCHANCHE MOORE.

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INTERNATIONAL ABSTRACT OF SURGERY

AUGUST, 1937

COLLECTIVE REVIEW

THE COMPARATIVE VALUE OF THE CULTURE METHOD IN THE DIAGNOSIS OF RENAL TUBERCULOSIS

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STAINING of smears of the sediment after centrifugation of the ureteral or bladder urine or both, alone and followed by inoculation of the sediment into animals, such as guinea pigs, rabbits, or fowl, have until recently constituted the two methods generally employed to determine the tuberculous character of a renal infection. Since 1924, when Loewenstein of Vienna and his associate, Sumiyoshi, found a method of eliminating contamination of the culture medium by other organisms, the inoculation of the urinary sediment on special media, a third method of bacteriological diagnosis of urogenital tuberculosis has been made available for daily laboratory use. It will be of interest to review the various steps in the history of the culture method, which have permitted simplification of what was formerly considered a method of diagnosis with little prospect of routine clinical application.

I RÉSUMÉ OF THE HISTORY OF DEVELOPMENT OF THE CULTURE METHOD FOR TUBERCLE BACILLI

This history can be divided into two periods: first, the period dating from the discovery of the bacillus in 1882 by Koch and his attempt in 1884 to obtain its growth on a culture medium up to 1924, and, second, the period since 1924, when Loewenstein's work was published. Koch succeeded in obtaining a culture on a beef-serum medium, but he declared that "the culture method would not play an important rôle in the study of the disease." In 1887 Nocard and Roux of the Pasteur Institute in Paris were able to use other mediums than that of Koch by adding from 5 to 8 per cent glycerine to bouillon, gelose, and

serum. In 1888 Pawlowski added the glycerine-potato medium to the preceding mediums. An egg medium was first employed by Capaldi in 1896, but it was rendered practicable only by Dorset. The problem in the earlier search for a method of culture was how to kill other bacteria, which developed so rapidly on the mediums as to make it difficult to identify the colonies of the tubercle bacillus. In 1908 Uhlenhuth proposed the use of antiformin, at least in sputum specimens, to accomplish this. In 1915, Petroff suggested a 4 per cent sodium-hydroxide solution as a substitute for the antiformin and, a little later, gentian violet. Corper and Uyei used crystal violet instead of gentian violet, but Sanchez showed that other aniline dyes, such as Congo red and malachite green, would act equally well. In 1924 Loewenstein and Sumiyoshi described a method of avoiding contamination which consisted in the addition of a sulphuric-acid solution to the sediment. Later, the use of a medium containing egg, asparagin, and Congo red or malachite green, which is extensively employed at present, was reported.

The bacteriologist who really deserves credit for having made the original Lubenau technique and the Loewenstein modification applicable for daily clinical use is Hohn, who in 1926 determined the sulphuric-acid concentration which would not kill the tubercle bacilli, but would destroy contaminating organisms.

Petragnagni, from 1923 to 1926, suggested the use of a medium, also much used at present, in which malachite green is employed. There are a number of other mediums which have been used, but space will not permit enumerating them all.

Those interested in the subject will find a complete review of this aspect of the question in the monograph by Saenz and Costil of the Pasteur Institute in Paris on the bacteriological diagnosis of tuberculosis (21) published in 1936. I have followed their work during the past six years and was able to study, with their collaboration, the clinical application of the culture method. Seventy cases of renal tuberculosis, to be referred to later, and 100 cases of pulmonary tuberculosis in which search for tubercle bacilli was made in urine specimens were studied.

Saenz and Costil are of the opinion that the glycerine potato medium can be eliminated as being less sensitive than the egg mediums. This opinion is confirmed by von Huth and Lieberthal (16) who compared the results of 300 inoculations on an egg medium with those of the same number of inoculations on a glycerine potato medium. Among the former, there were 190 positive, 93 negative and 17 contaminated cultures and among the latter 132 positive, 141 negative, and 27 contaminated cultures. Saenz and Costil consider the Loewenstein medium and that of Petragnagni modified according to Saenz as the best. The preparation of these is given in detail on pages 22 and 23 of the Saenz and Costil monograph.

II. COMPARISON OF THE CULTURE AND GUINEA PIG INOCULATION METHODS

De Carvalho (8) has called attention to the fact that a smaller number from 1 to 10 of tubercle bacilli are necessary to obtain a positive culture or guinea pig inoculation than in the case of a smear, which is positive only if from 10 to 10,000 bacilli are present in the specimen to be examined. Corper (7) states that as many as 100,000 bacilli per c. cm. must be present before they can be seen under the microscope.

Saenz is of the same opinion, i.e., only a few bacilli are needed for a successful guinea pig inoculation. Therefore the latter can be considered a better method when the sediment contains many secondary organisms because the chemical agents employed in the preparation of the Loewenstein or Petragnagni mediums alter the tubercle bacilli more or less. Clinically it is advisable to use both the culture and the guinea pig inoculation methods. The culture method excludes the possibility of death of the guinea pig from intercurrent non tuberculous infections or spontaneous tuberculosis; the latter condition may develop from contact with infected tuberculous animals. Except in the rare cases of infection by certain strains of the bovine type of

tubercle bacillus, in which the colonies require forty days to develop, the same time required in guinea pig inoculation, the culture method gives more rapid results.

Corper, Saenz and others have called attention to the "microculture" or "microcolony" technique by which an earlier diagnosis of the growth of tubercle bacilli can be made by scraping the surface of the inoculated medium and making a smear from the scrapings. It is not always necessary to wait until colonies are visible on the inoculated medium. To illustrate the advantages of this microculture over the visible colony method I will cite the results which were obtained by us in cultures from 70 cases of suspected renal tuberculosis. The bacteriological examination with smear and culture was carried out at the Pasteur Institute in Paris by Saenz and Costil and the clinical data and specimens were secured from various large urological Parisian clinics and personal private patients by the writer. The detailed results were published in 1932 and 1934. In the first series (22) of 57 cases, 29 microcultures from the same number of patients, were found to be positive 7 on the eighth, 5 on the ninth, and 4 on the tenth day after inoculation of the medium and 1 only on the thirtieth day. At a later date visible growth was noted in all of the 29 tubes after fifteen days in 2, sixteen days in 2, seventeen days in 2, eighteen days in 4, nineteen days in 4, and later in the remainder.

In our second series (10) the earliest positive microculture was obtained on the seventh day and the first visible growth on the fourteenth day. These observations confirm those of von Huth and Lieberthal, Bonino, and others who have found that a positive culture can be obtained at a much earlier date with inoculation of the urinary sediment in which contamination has been eliminated than with the guinea pig method except as stated above in the case of certain strains of the bovine type of tubercle bacillus.

Bonino (4) of Turin used the microculture method of examination in the study of 47 cases in which a clinical diagnosis of renal tuberculosis had been made. In 40 the microculture was positive between the seventh and seventeenth day following inoculation.

During the examination of our first series of 57 cases there was a difference in the results in two cases following the use of the culture and guinea pig methods. A few colonies of tubercle bacilli were found in the culture whereas the guinea pig test was negative after the lapse of the same period of time following inoculation. In one of the two cases the microculture was positive on

the thirtieth day and only two colonies were visible on the thirty-fourth day, which findings show the advantages of the microculture method.

In cases of occluded renal tuberculosis or in which there is only limited communication between the focus and the renal pelvis, the bacilli are found in the urine only intermittently. In five of our first series, the culture was alternately positive and negative. In Case 8 the culture and guinea-pig inoculation were both positive on January 6, 1932, whereas on December 29, 1931, the smear was negative. The following day, a few bacilli were found in the smear. After removal the kidney showed a relatively large caseous area, which was almost completely occluded. Similar observations were made in the four other cases of the first, and two of the second, series.

Van Riemsdijk (24) found the culture positive but the guinea-pig test negative in one urine examination. His results of comparing the smear and culture will be found in the next section of this review.

Fischer and Uργοiti (11) in testing the urine of 86 patients found the culture positive in 35 and negative in 51. The guinea-pig inoculation test was positive in only 30 of the 35 cases and negative in 56. There were five cases, therefore, in which the culture method was superior to the guinea-pig test.

Blair and Hallman (2) examined the urine of 6 patients by both culture and guinea-pig tests, but their report does not give the results of the examination in these 6 cases separately. They are included in a similar study of 38 specimens from non-renal sources.

Haase (12) found the culture positive and guinea-pig test negative in 3 cases, but on the other hand in 9 cases the guinea-pig inoculations were found to be positive while the cultures were negative. The author states that these comparisons were made at a period when he was less familiar with the Hohn technique, and therefore the culture method was not responsible for the discordance in results. When his paper was published in 1930, Haase stated that he was employing both methods.

Norton, Thomas and Broom (2) compared the guinea-pig inoculation and culture methods in 13 urine specimens in which the smear was positive. Both the guinea-pig and culture methods showed positive results in 5 of the 13 cases, but the culture alone was positive in 8 of the 13 cases.

Findings which vary greatly from those of the majority of other recent authors appear in a recent article of Seidman (23), published in 1933. Three mediums were used, viz., Corper and Uyei,

Petroff, and Sweany. Whenever possible, the sediment was treated with all of three reagents: 6 per cent sulphuric acid, 3 per cent sodium hydroxide, and 5 per cent oxalic acid.

Twenty-five guinea-pigs which were inoculated with sediments showing no acid-fast bacilli in the direct smear developed tuberculosis. Cultures were positive in only 10 of the 25 sediments. On the other hand, there were no instances in which tubercle bacilli were demonstrated by culture while the corresponding guinea-pig was negative. Therefore the author believes that the culture method seems to be less accurate than the guinea-pig inoculation method.

In another paragraph was the statement, "the culture method did not shorten the time necessary for diagnosis." The earliest visible growth was noted in sixteen days, and only 41.6 per cent of the cultures were positive four weeks after inoculation, while 36.1 per cent of the guinea-pig tests were positive. This last observation varies greatly from those of others who have studied the question and whose results will be cited later.

Seidman states further on: "The cultures are inexpensive and easy to handle. They also form an interesting check. But for purposes of routine clinical laboratory work, the culture method has not reached the state of perfection that would warrant its substitution for guinea-pig inoculation."

As stated at the beginning of this section of the Collective Review, the newer culture method has not and should not supplant the older staining or guinea-pig inoculation methods.

In seven of our first series of 57 cases, the smear, the guinea-pig inoculation, and the culture methods were all negative.

Before closing this section on the comparative value of the culture and guinea-pig inoculation methods, some precautions as to the interpretation of the culture findings and choice of mediums as pointed out by Saenz and Costil are advisable. All work should be carried out in a closed room, so as to avoid the deposit of acid-fast saprophytic bacilli present in dust. The tubes should be kept in the incubator for two days before being inoculated and fresh medium should be prepared every eight or ten days. From 6 to 8 tubes should be inoculated with about 0.5 c. cm. per tube of sediment previously treated by the Loewenstein-Hohn technique. In order to differentiate atypical strains of tubercle bacilli, two additional tubes containing 1 per cent glycerine should be used. The Loewenstein and the Petragagni mediums are not only very sensitive but permit the distinction between the bovine, human, and avian

types by means of the appearance of the primary culture. Coagulation of the mediums by dry heat aids in the differentiation of the type of tubercle bacillus. If contamination by acid fast saprophytes is feared, one-half of the inoculated tubes can be kept at ordinary room temperature and the others in the incubator.

There are two groups of acid fast saprophytes. One is found in dust, vegetables, and the water of laboratory faucets. The other is found in blood from warm blooded animals, sputum, urine, and human blood. The latter group develops only in glycerine mediums at incubator temperature. If no growth has taken place on the inoculated medium at the end of ninety days, the result may be considered negative. Every tube should be examined at intervals and a smear made from every suspicious colony because certain fungi, sarcinae and other bacteria of the corynebacterium group may appear late and present the morphology of the colonies of the tubercle bacillus.

With certain exceptions every guinea pig should be killed within three months after inoculation unless death takes place before from tuberculosis. The development of tuberculosis in a guinea pig inoculated from six to twelve months previously indicates spontaneous infection if no other means of infection such as ulceration or abscess formation at the site of inoculation and corresponding tuberculous inguinal and lumbar lymph nodes, are found. Such a spontaneous infection can follow cohabitation with infected animals or the ingestion of infected food. Saenz and Costil at the Pasteur Institute found that during a period of three years 15 of 187 newborn guinea pigs left for variable intervals in contact with or near infected animals (in a large room containing 3,000 guinea pigs in cages) developed spontaneous tuberculosis.

III. COMPARATIVE VALUE OF CULTURE AND SMEARS

The results of various authors although in discordance in a small number of cases, show in general the superiority of the culture over the smear method of search for tubercle bacilli in the urinary sediment in suspected renal tuberculosis.

Hohn (14) in his 1926 paper, reported the examination of the urine of 20 patients. The culture was positive in all 20 (100 per cent) of the cases and the smear positive in only 7 (35 per cent). In his 1932 paper (15) he states that the culture was superior in 70 per cent of the cases.

Brechmann (5), in 51 cases found the culture positive in 15 and the smear positive in only 10.

Van Riemsdijk, in 25 cases, found the culture positive in 14 and the smear positive in only 9.

Von Huth and Lieberthal, in 300 cases found the culture positive in all and the smear positive in only 250.

Lundquist (17) examined the urine of 31 patients. The culture was positive in 16 and the smear negative in all of the 16 cases.

Erkendath, Saenz and Costil, in their first series examined the urine of 57 patients. The smear and culture both were negative in 27. Guinea pig inoculation was also negative in 7 of these 27 cases. The culture was positive in 30 and the smear positive in only 20 of these 30. In the second series 13 additional cases were examined. The culture was positive and the smear negative in 5.

Fischer and Urgotti (11) had the following results in comparing the smear and culture methods in the search for tubercle bacilli in the urine. The smear was positive in 25 (12.3 per cent) of 308 specimens. The culture was positive in 106 (40 per cent) of 227 specimens. Colonies were visible as early as from the tenth to the fourteenth day but occasionally only at the end of twelve weeks. The authors advise that a smear should be made from the surface of the inoculated tube even when there are no visible colonies. The "microcolony" method of examination has already been mentioned.

Miraglia (16) in 19 cases found the smear from sputum, pus, urine and cerebrospinal fluid positive in 33.3 per cent of the cases and the culture positive in 61 per cent.

Seidman (23) found the smear positive but the culture negative in 14 cases. This is a larger ratio of negative cultures with positive stain than in any of the preceding reports. His results of comparing the culture and guinea pig tests have been given.

Haase (12) found 45 positive cultures among 500 cultures on the Hohn medium. In 31 of the former the microscopic examination of the smear proved negative. In the 31 cases, the urine was examined in 14, the pus in 20, the sputum in 5, the prostatic secretion in 1 and the ascitic fluid in 1, therefore the culture was superior in 68 per cent of the cases. In two cases, the culture was negative but the smear positive. In a number of cases, the culture was positive as early as five days after inoculation. The culture was considered negative when there was no growth at the end of fifty days.

Norton, Thomas, and Brown examined nearly 400 specimens of which 178 were urine. Among the latter the culture was positive in 18 cases in which the smear was negative.

Ascoli (1) in examining the urine of 29 patients found that the microculture was positive but the smear negative in 6 instances. The average length of time that elapsed before the microculture was positive in 19 cases was twelve days, and the earliest positive finding required 7 days. All of his positive-culture cases were confirmed by operation.

Bochkor (3), in examining the urine of 41 patients, found the smear positive in all and the culture positive in 40. The variance was due to contamination of one culture tube by other non-tuberculous organisms in the urine, which cover the entire surface of the medium in twenty-four hours unless the sediment is previously treated.

INTERPRETATION OF SMEARS IN WHICH ACID-FAST BACILLI ARE FOUND

By prolonged search and good staining technique, tubercle bacilli can be found in the ureteral urine by the smear method in from 85 to 90 per cent of the cases of renal tuberculosis. Thomas, in a relatively large series of cases, found the bacilli in the mixed or bladder urine in 77 per cent of the cases and in the ureteral urine in 93 per cent. It is beyond the scope of this review to take up the question of whether the presence of tubercle bacilli in the ureteral urine always denotes renal tuberculosis and is an indication for nephrectomy. When acid-fast bacilli are found in a smear, it must be certain that every precaution has been taken to exclude contamination by acid-fast saprophytes. They have been found on slides, on laboratory glassware, in tap water, and in chemical reagents used in preparing the smear. Saenz insists that only new slides, previously immersed for several minutes in a strong acid-alcohol solution, should be employed for smears. In addition, after having been dried, the slides should be passed through the flame of a Bunsen burner. Slides previously used may conserve acid-fast saprophytes on their surfaces until thoroughly heated. Ordinary tap water or distilled water which has been kept in the laboratory for some time must never be used, because of the presence of saprophytic acid-fast bacilli in such liquids. This was shown to be the case by Saenz and Costil in a series of experiments at the Pasteur Institute. These acid-fast saprophytes cannot be distinguished from tubercle bacilli. Previously used and insufficiently cleansed centrifuge tubes may contain dead acid-fast bacilli in large numbers. It must also be borne in mind that acid-fast bacilli can adhere to the immersion lens, if it is improperly cleaned after examination of a smear. The immersion oil dropper should

never be allowed to touch a smear, lest acid-fast bacilli be transported to the bottle. Aside from acid-fast saprophytes of the myobacterium type, there are certain fungi, corynebacteria, and all spores which are acid resistant.

An important fact to bear in mind in the search for tubercle bacilli in the urine from a case of suspected renal tuberculosis is that one must never be content with a single examination of the centrifuged sediment by any or all of the three methods, smear, culture, and guinea-pig test. It is not an uncommon experience to encounter one of the following combinations: (a) to find many bacilli one day and none a few days later, and (b) to find that repeated examinations are negative and then suddenly see a few bacilli in the previously negative smear or culture. The latter combination may be true also of the guinea-pig test. These diurnal or weekly variations in the elimination of bacilli from the kidney were noted in 14 of the 57 cases of our first series and in 3 of the 13 cases of our second series. One of the 14 cases was of especial interest. The patient was a girl nineteen years of age, who was treated in the Out-patient Clinic of the Necker Hospital, in Prof. Legueu's service, for cystitis, although renal tuberculosis was repeatedly sought as the origin of the vesical symptoms. Smears from the bladder urine made on March 16, August 20, and 24, were all negative. The same was true of smears made from the bladder and right ureteral urine on August 8th. Our culture was positive in the microcolony on the eighteenth day and there were visible colonies on the twenty-sixth day. The smear from the bladder urine was positive for the first time on September 30, about nineteen days after the bacilli had already been found by microculture and eleven days after colonies were visible on the surface of the tubes inoculated with the bladder urine found negative in smears. The removed kidney confirmed the bacteriological diagnosis. The variation in elimination of the bacilli from the tuberculous kidney is directly related to the protean manifestations of the disease as observed on removed kidneys. Tuberculous foci exist in which communication with the renal pelvis is free one day and obstructed the next. Again, there are cases of the occluded form in which there may be complete obstruction of the pelvic outlet for a long time and then suddenly a small amount of pus escapes.

The culture method is of especial value in checking up results in operated cases. It has been hitherto believed that the tubercle bacilli would disappear from the urine in about six months, provided that the remaining kidney was not in-

types by means of the appearance of the primary culture. Coagulation of the mediums by dry heat aids in the differentiation of the type of tubercle bacillus. If contamination by acid fast saprophytes is feared one half of the inoculated tubes can be kept at ordinary room temperature and the others in the incubator.

There are two groups of acid fast saprophytes. One is found in dust, vegetables, and the water of laboratory faucets. The other is found in blood from warm blooded animals, sputum, urine, and human blood. The latter group develops only in glycerine mediums at incubator temperature. If no growth has taken place on the inoculated medium at the end of ninety days, the result may be considered negative. Every tube should be examined at intervals and a smear made from every suspicious colony because certain fungi, sarcinae, and other bacteria of the corynebacterium group may appear late and present the morphology of the colonies of the tubercle bacillus.

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Norton, Thomas and Broom examined nearly 400 specimens of which 178 were urine. Among the latter the culture was positive in 18 cases in which the smear was negative.

culture was positive and in which the guinea-pig test was also employed, the latter was equally positive

No effort has been made to give any details as to the technique of preparation of the various mediums employed in cultivating tubercle bacilli found in urine specimens. These details, as well as a description of how such specimens should be treated before being inoculated to exclude contamination, is beyond the scope of a collective review, which aims only to evaluate the newer culture method of diagnosis from the clinical point of view and compare it with the older smear and guinea-pig inoculation methods

SUMMARY

Staining of smears of the centrifuged urinary sediment alone, and followed by inoculation into guinea-pigs, have until 1924 constituted the two most frequent methods employed in the bacteriological diagnosis of renal tuberculosis. Since 1924, when Loewenstein showed that contamination of the mediums used for cultivation of tubercle bacilli could be eliminated by treatment of the urinary sediment with sulphuric-acid solution, the culture method has been so simplified that it is possible to use it as an almost routine laboratory procedure in addition to the smear and guinea-pig methods

The author believes that the two mediums commonly employed by Saenz and Costil of the Pasteur Institute in Paris will give a larger percentage of positive results than any other. The preparation of these two mediums, the Loewenstein and the Saenz modification of the Petragnam, as well as the method of treatment of the urinary sediment before inoculation, can be found in a recent monograph by Saenz and Costil and in publications by other bacteriologists

In a comparison of the culture and guinea-pig inoculation methods it must be kept in mind that only a few, from 1 to 10 tubercle bacilli are necessary to produce a positive result with both of these methods, whereas according to Corper, as many as 100,000 bacilli per c cm must be present in order to be seen under the microscope in a smear of urinary sediment

Clinically, it is advisable to employ both the culture and guinea-pig methods, because the former excludes the possibility of death of the guinea-pigs from spontaneous tuberculosis or intercurrent infections. The culture method, with rare exceptions, gives more rapid results, especially if a smear is made from the surface of the inoculated medium before the colonies are visible

Various contributions are cited which show that a positive culture result can be obtained as early as the fifth day after inoculation of the medium. The average period is from 12 to 14 days, seldom later, at which time visible colonies also appear. It is usually necessary to wait six weeks to obtain a positive result from a guinea-pig test.

One must always remember that there is marked variation in some cases in the elimination of tubercle bacilli from a renal focus. This is in direct relation to the changes in the lesions themselves. The various bacteriological tests may be negative on one or several successive days and positive a few days or weeks later.

In the interpretation of smears as well as of cultures, the possibility of contamination by acid-fast saprophytes as well as by smegma bacilli must be borne in mind. As to the latter, however, such confusion is more theoretical than real.

According to the various contributions a comparison of the culture and smear tests shows beyond all doubt that the culture method is the better

Relatively few studies are found in which a comparison of the three methods (smear, culture, and guinea-pig inoculation test) has been carried out. They show, however, that it is advisable to employ all of these methods in the doubtful cases

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volved nor that a genital focus existed. In our first series of 57 cases, the culture was still positive in 4 cases, three, four, five, and six years respectively after operation. In the second series of 13 cases the culture was positive in 1 case, ten years after operation by Chevassu.

In the interpretation of acid fast bacilli as seen in smears or occasionally found on the surface of the inoculated culture medium reference has already been made to acid fast saprophytes.

Another acid fast bacillus which theoretically might be mistaken for the tubercle bacillus is the smegma bacillus. Practically such confusion need not be given serious consideration, although some differences in opinion still exist. If the urine specimen has been received directly from the kidney by ureteral catheterization, contamination by smegma bacilli need not be feared because it can be taken for granted that the external genitalia in both sexes have been thoroughly cleansed preparatory to the introduction of the cystoscope. It is only in cases presenting mixed or bladder urine in which the patient has not been catheterized but has voided spontaneously that smegma bacilli might be included in the specimen.

Only one recent paper (6) by Capuani refers to the resemblance in morphology of the smegma and tubercle bacilli. Capuani stated also that a twenty five minute exposure to a 33 per cent solution of sulphuric acid is needed to kill the smegma bacilli. The latter can be grown easily on egg mediums and develop more rapidly than the tubercle bacilli.

Dimitza (9) advises a control of the most frequently employed Ziehl Neelsen stain by using also a Gram stain to eliminate the smegma bacillus, if there is any doubt about the morphology of the acid fast bacilli. In two cases in which smegma bacilli were found in the smear they were killed by using the same concentration from 10 to 12 per cent of sulphuric acid solution as is employed in the elimination of the most common contaminating organisms such as streptococci, staphylococci and bacilli coli in the Loewenstein Hohn technique previously referred to. Dimitza is of the opinion that it is very difficult to obtain cultures of the smegma bacillus. After a twenty minute exposure to the action of a 10 per cent sulphuric acid solution, the smegma bacilli tubes showed only a very slight growth. After from twenty to thirty minutes action of 12 or 15 per cent solution of the same acid there was no growth and therefore he believes that for all practical purposes the smegma bacilli need not be considered when the sediment has been treated according to the Loewenstein Hohn technique.

Von Huth and Lieberthal in 100 cultures from cases of suspected renal tuberculosis never found smegma bacilli when smears were made in association with either the Ziehl Neelsen or Old staining techniques. As they were never found in the 100 cultures the presence of the acid fast smegma bacillus is not to be feared either in smears or cultures. The same authors stained 45 specimens of smegma without finding bacilli.

Borhkor (3) was unable to find smegma bacilli in 41 cases in which the smear for tubercle bacilli was positive, and in 40 of the 41 in which the culture was positive.

In view of the observations in the last two papers a possible confusion of smegma and tubercle bacilli can practically be excluded. In case of doubt, a guinea pig inoculation should be carried out.

IV. COMPARISON OF SMEAR, CULTURE AND GUINEA PIG INOCULATION

As yet there are comparatively few reports in which these three methods were used in the search for tubercle bacilli in cases of suspected renal tuberculosis. Seidman found both the smear and culture negative in 15 cases and the guinea pig test positive in all 15. Hirschberg (13) examined 69 specimens composed of tissue, spinal fluid, and urine. In the 7 urine specimens the smear and guinea pig test were negative in four, and the culture positive. In 2 cases the smear was positive but the other two methods gave negative results. In one case the smear was negative but the culture and the guinea pig test were positive.

Dimitza used the culture method in the examination of 300 cases. In 114 of these the specimen examined was urine. Of the total of 300 cultures 219 were negative and 81 positive. In the latter cases, the smear was positive in 58 or 72 per cent, the guinea pig inoculation test was positive in 76 or 94 per cent and the cultures were positive in 80 or 98 per cent. There were six of these examinations in which the results were at variance.

Smear	Guinea pig	Culture	
Positive	Negative	Negative	1 case
Negative	Positive	Negative	1 case
Negative	Negative	Positive	4 cases

Nasta and his associates (19) examined the urine of 20 patients in whom the diagnosis of renal tuberculosis was confirmed by operation. The smear was positive in only 5 (25 per cent), whereas the culture was positive in all of the 20 (100 per cent). In two of the cases in which the

culture was positive and in which the guinea-pig test was also employed, the latter was equally positive.

No effort has been made to give any details as to the technique of preparation of the various mediums employed in cultivating tubercle bacilli found in urine specimens. These details, as well as a description of how such specimens should be treated before being inoculated to exclude contamination, is beyond the scope of a collective review, which aims only to evaluate the newer culture method of diagnosis from the clinical point of view and compare it with the older smear and guinea-pig inoculation methods

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ABSTRACTS OF CURRENT LITERATURE

SURGERY OF THE HEAD AND NECK

HEAD

Mullen, T. F.: Internal Derangement of the Temporomandibular Joint. *West J Surg, Obst & Gynec*, 1937, 45 181

The temporomandibular joint has become functionally and architecturally complicated during the long developmental change from primitive forms. A description of its anatomy explains three possible movements hinge, gliding, and oblique. This article deals with the disability known as "snapping jaw" in which there is a disturbance of the normal relations of the condyle, meniscus, and articular eminence on closing the jaw. The condition is rather frequent, is seen usually in young adults, especially women, and is bilateral in one third of the cases. It results from a relaxation of the extrinsic ligaments of the joint, either primary or due to arthritis of the joint. The chief primary cause is trauma, and this is not infrequently the result of dental procedures and stretching of the lower jaw under anesthesia, as from mouth gags during tonsillectomy. Ill-fitting dental plates, arthritic processes in the joints or pterygoid muscles may cause a continued strain which produces the condition. The condition includes inflammatory changes in the joint structures with relaxation of the capsule and dislocation or other changes in the meniscus.

The symptoms include a cracking or snapping of the joint which varies in frequency and degree. Severe pain is rare unless there is spasmodic contracture of the jaw muscles. One distressing symptom is locking of the joint with the mouth either open or closed.

The treatment in the early stages is conservative, with the use of rest, heat, and salicylates. Manipulation will practically always overcome any locking. Abnormalities of occlusion should be corrected by elastic bands on the teeth or other dental procedures. Injections of irritating substances into the joint for the purpose of tightening the capsule have been recommended.

Operation is indicated when persistent subluxation and locking occur, when the snapping is loud enough to be annoying, and when conservative measures have failed. Excision of the condyle is probably unnecessary. Excision or plication of the capsule and removal of all or part of the meniscus are the commonest operations. The proper procedure is dependent on the condition found after exposing the joint. This is done best with a straight incision in front of the ear with care to avoid the temporal branch of the facial nerve.

CHESTER C. GUY, M.D.

Worth, H. M.: Tumors of the Jaw. *Brit J. Radiol*, 1937, 10 223

This article deals principally with tumors occurring in the jaws because of the presence of dental tissue. The local type of osteitis fibrosa is described also. The tumors of dental origin are termed "odontomes", dental and dentigerous cysts are included among these tumors, which is not in accordance with the American custom. The following is the classification of the author.

Epithelial odontomes arising from the dental epithelium alone: dental cysts, dentigerous cysts, and multilocular cysts.

Composite odontomes arising from the dental epithelium and dental mesoblastic tissue: complex odontomes, compound odontomes, geminated odontomes, and dilated odontomes.

The description of dental cyst includes both what we term a radicular cyst and a follicular cyst without tooth formation. Attention is called to the fact that in the presence of secondary infection and suppuration the typical cystic cortex may have been destroyed, and that it is sometimes difficult to distinguish a cyst from the maxillary sinus. The cyst has a cortex which is usually more sharply defined and less wide than the antral wall, the cyst outline is sometimes more of a true circle than the antral wall.

The dentigerous cyst is less common and occurs in younger patients, it may be multiple. The multilocular cyst is the adamantinoma occurring as the solid and cystic type. The first presents a honeycomb appearance which may be mistaken for an osteoclastoma. The latter occurs with the margin of bone clearly defined, not corticated and with irregular trabeculation, and, as the true multilocular type with clearly defined cavities, it not uncommonly contains a tooth.

Complex odontomes are irregular masses of enamel, dentine, and cementum, with a fibrous capsule seen as a dark line surrounding the calcified structure. Composite odontomes are made up of any number of separate structures resembling badly formed teeth. They may be cystic or they may resemble the complex type when they are encapsulated. Geminated odontomes are caused by the fusion of two teeth. Dilated odontomes are in one part, the root, which may be bulbous, clubbed, mushroomed, or hollowed out.

Osteitis fibrosa, the local type, is by no means rare. The author distinguishes three varieties.

The first occurs in the maxilla of young patients and results in a swelling of the molar and premolar region. The newly formed bone has a uniform den-

sity is stippled like the peel of an orange, and at operation is found to be quite soft.

The second, which is found in older patients forms new bone from the border of the maxilla and interferes with the closing of the mouth. It is dense and structureless and very hard.

The third occurs in the mandible which shows an increase in depth. The roentgenogram shows a 'ground glass' granular or stippled formation. There may or may not be areas of rarefaction. The bone is found to be hard at operation. In all cases the histological structure is that of osteitis fibrosa.

The article takes up principally the roentgen diagnosis of these lesions. The illustrations twenty roentgenograms are excellent.

KURT H THOMA M.D.

Phemister D. B., and Grimson K. S. Fibrous Osteoma of the Jaws. *Ann Surg* 1937 105: 561.

Tumors of the jaws should be considered apart from tumors of bone in general, particularly because they are preformed in the membrane instead of the cartilage. Benign tumors that contain cartilage and ossify through cartilage may arise in the jaws, however, because of embryonic cartilage rests. In the maxilla they may arise from a cartilaginous mass developing in the malar process or the adjoining cartilaginous nasal capsule in the mandible from a remnant of Meckel's cartilage behind and below the incisor teeth or the accessory cartilages along the posterior edge of the ramus and the anterior edge of the coronoid processes and at the symphysis.

The great majority of ossifying tumors of the jaw are free from cartilage and consist of fibrous tissue and bone. These tumors have been described in the literature as fibrous osteomas or ossifying fibromas or osteobromas. Thirteen cases presenting such lesions, four in the maxilla, eight in the mandible and one in both bones are presented by the authors and two other cases reported by Montgomery are reviewed. A general discussion of the cases reported in the literature showed that in addition to the above terms articles appear with the heading osteoma, exostosis, hypertrophic localized osteitis, osteodystrophia fibrosa localisata and localized osteitis fibrosa, also that these tumors occur between the ages of eight and thirty-two, the highest age of onset being fifty-four. Only three cases were followed for more than one year and seven years was the longest period of observation. In nineteen cases the lesion occurred in the maxilla, in seven in the body of either side of the mandible, in one in both maxilla and mandible on one side. No cases were reported to have undergone sarcomatous changes. Very small cysts were found in two cases, a small number of giant cells in five and myxomatous areas in one case. Trabeculae of new bone in a mosaic pattern and fibrous marrow spaces were mentioned in all reports. There was a history of trauma in two cases, caries of teeth and extraction in eleven and pharyngeal infection in three. In ten cases it was stated the remaining skeleton showed no other bone disease. The

blood calcium which was analyzed only in one case showed moderate hypocalcemia.

In the authors' cases no abnormalities in the remaining skeleton or blood calcium and phosphorus were found. Cysts were absent and giant cells in frequent. The tumors are not related to osteitis or osteodystrophia fibrosa generalisata, Paget's disease, or epulis. Though the etiology is undetermined, these tumors have a relationship to membrane preformed bone which is parallel to the relationship of benign cartilaginous tumors and exostoses to cartilage preformed bone.

A study of the histology brings out the great variability in the amount of fibrous and osseous tissue. Some tumors are composed of rather small bone trabeculae with partly fibrosed marrow, others have islands of fibrous tissue undergoing varying degrees of ossification and calcification. There may also be areas of myxomatous tissue as found in three cases and giant cells as found in two cases. A minute trace of cartilage was observed in one case. Round-cell infiltration and other inflammatory changes were absent. The more mature tumors are better called fibrous osteomas and those in which fibrous tissue and immature bone predominate should be called ossifying fibromas.

The treatment recommended in the literature varies. Some writers report benefit from radium treatment, but point out the danger of bone necrosis and slough following this treatment. The authors state that the early treatment by massive resection, which was very disfiguring and carried a high mortality, is no longer justified in view of the benign nature of the lesion. Biopsy should be performed to establish this benign nature definitely. The lesion should then be removed operatively as thoroughly as possible without great destruction of the jaw bone in diffuse involvement. Small tumors should be excised completely. The operation however may not cure the patient when recurrence takes place, partial or total resection is indicated.

Irradiation was used in six cases of incomplete excision. The doses of roentgen therapy varied from 510 to 1,465 roentgen units. One patient received over a period of time first 3,833, later 824 roentgen units. One of the patients was markedly another moderately benefited. Four were treated too recently to warrant an expression of opinion. According to the experience of the authors, roentgen therapy is beneficial in controlling portions of the tumor not removed at operation.

KURT H THOMA M.D.

EYE

Flincham E. F. The Mechanism of Accommodation. *Brit J Ophth* 1937 Monograph Supp. (11).

This monograph represents largely a systematic arrangement of an investigation on the mechanism of accommodation previously reported by the author. The various theories are discussed and the anatomical peculiarities of the ciliary body and lens

are described in detail. Much experimental evidence is presented.

The author believes that there is sufficient proof that accommodation is brought about by a reduction in the tension under which the lens is suspended. As evidence for this view he submits the following.

The anatomy of the ciliary muscle suggested that its inner portion acts as a form of sphincter muscle, so that in contraction the ciliary corona from which the lens is suspended from the zonula is reduced in diameter.

This conclusion was verified by the records of the movements of the inner edge of the ciliary body in a case of aniridia.

The lens was displaced in the direction of gravity during great efforts of accommodation, its position was not affected by gravity in the unaccommodated state.

In the case of an eye with an empty lens capsule which was reported in detail, the difference between the tautness of the capsule in the unaccommodated state and the slackness during an effort of accommodation, could be accounted for only by the relaxation of the tension under which the capsule was being held.

In the dissection of the eye of a child in whom the lens was found to be in the unaccommodated form after the removal of the cornea and iris, the anterior surface of the lens assumed a form consistent with an accommodation of 14 diopters when the suspensions of the lens were severed.

This evidence indicated the general truth of the Helmholtz theory of accommodation. However, this rather widely accepted theory does not explain the conoidal form of the anterior lens surface during accommodation nor the loss of accommodation with age. From theoretical and experimental data the author concludes that when the tension of the anterior lens capsule is released by contraction of the ciliary muscle, the capsule presses upon the soft lens substance and moulds it into the accommodated form by compressing it at the equator and in those regions where the capsule is thickest, allowing it to bulge in the thinner parts. This is quite compatible with the loss of accommodation with age, as the hardening lens gradually becomes less susceptible to the pressure of the capsule. While there may be some loss in power of the ciliary muscle in the senile eye, it does not seem sufficient to explain the early onset and gradually progressive change encountered.

WILLIAM A. MANN, M.D.

Tillema, A.: *Traumatic Glaucoma: An Anatomical and Clinical Study*. *Arch. Ophthalm.*, 1937, 17, 586.

Only two anatomical descriptions of traumatic glaucoma have been published (Garnier, 1891; Morax, 1922). A few cases are reported in which the eyeball had to be removed after contusion. The selection of the cases from the literature was made in such a way as to exclude the possibility of intra-ocular infection. Two additional cases are added by the author.

Garnier stated that the iris, as well as the angle of the anterior chamber, was normal, and his observations closely resemble the microscopic observations in the author's cases.

In the two cases reported the globe was cut into serial sections, and every tenth section was stained with iron hematoxylin or by Van Gieson's method. Intermediate sections were prepared later for special purposes. The microscopic findings were described in great detail, and were accompanied by many excellent photomicrographs.

There was no sign of a perforating wound or of infection in either case. The pathological changes were divided into two groups, a large group of destructive changes and a smaller group of regenerative changes. The destructive changes that were caused directly by the trauma were separated from the others, as they were the most likely to give the key to the problem of traumatic glaucoma.

All formation of new vessels and scar tissue, and all transport of debris were regarded as regenerative changes. Formation of new vessels was seen only in the cornea in the first case. Formation of scar tissue was seen in the choroid and sclera. Transport of debris was seen in many places, more especially in the vitreous and around the vessels in the sclera. Numerous loose pigment granules partly hematogenous and partly derived from the uvea, usually occurred together, but pigment around the vorticoses veins was almost exclusively hematogenous. Growth of lenticular epithelium along the torn capsule and the anterior part of the hyaloid membrane was observed in one case, illustrating that the lens itself is a living tissue.

The remaining changes were destructive, as some of them have been observed in eyes that have never been injured. It was unlikely that these changes constituted a primary factor in the origin of traumatic glaucoma. After discussion of the various changes the author summarized those which were probably directly related to the accident, as follows: partial rupture of the sclera, pectinate ligament, lamina cribrosa, and optic nerve; tear and partial necrosis of the iris, necrosis of the ciliary body, rupture of the choroid and retina, rupture of the ciliary and vortex vessels in the inner layers of the sclera which is probably related to rupture of the sclera, subluxation of the lens; and isolated degeneration of bundles of the ciliary nerves. Hemorrhage into the vitreous may have occurred immediately or later.

Five cases of traumatic glaucoma were observed, and the findings were described. The findings in these cases were compared with those in several cases of simple contusion. In fifteen cases of simple contusion slight intra-ocular lesions and a varying degree of instability of tension were present. Instability of tension without any visible intra-ocular injury was observed in seven cases. From the comparison one may conclude that from the most severe cases of traumatic glaucoma to the simplest cases of contusion every intermediate stage of severity of the intra-ocular injury, and instability

of tension is found. Instability of tension causing no visible injury to the inner part of the eye may occur in young patients with normal eyes after contusion.

Other cases were added from the literature which were not described as traumatic glaucoma but which may be regarded as such. These cases were grouped according to the accuracy of the description. The number of intra ocular hemorrhages, dislocations of the lens and pathological changes in the choroid and retina ran parallel with the course and severity of the disease. Dislocation of the lens was accompanied by other severe intra ocular damage and constituted a symptom of the disease but not its cause. In the presence of lens dislocation an unfavorable course indicated the presence of other serious lesions and was therefore of prognostic significance only.

The difference between cases of traumatic glaucoma and cases of simple contusion was the presence of serious intra ocular lesions in the former. A predisposition to glaucoma or retinobulbar obstruction was rejected as a factor in the cause of traumatic glaucoma. While intra ocular hemorrhage could be a bar to normal filtration, hemorrhage could not be a frequent cause. Indodialis was an unlikely factor in the increase of tension. Paralysis of the ocular motor nerve was not accompanied by glaucoma and therefore paralysis of the ciliary muscle through tearing could not be the cause. Vascular lesions could not have been the cause because the collateral circulation was good and because the vascular lesions alone did not greatly influence the circulation.

Hegner found that when the lens was completely dislocated glaucoma was less frequent than in cases of dislocation into the anterior chamber but dislocation of the lens alone was no direct cause for glaucoma.

The influence of lesions of the nervous system was demonstrated by the occurrence of glaucoma with herpes zoster. Experimentally also there was evidence to demonstrate nervous influence. Garner deduced the presence of lesions in the nervous system from the presence of corneal anesthesia. Their presence must also be surmised in cases of traumatic glaucoma without visible signs of injury. Simple hypertony and hypotony could be regarded as the reaction of the normal mechanism to a blow whereas traumatic glaucoma was the pathological reaction. In the former the healthy neurovascular system readjusted itself in the latter it was hampered by lesions in the nervous system such as Tillema described microscopically.

The presence of the more serious lesions of the eye made the prognosis more doubtful especially the presence of dislocation of the lens and hemorrhage into the vitreous.

In cases of simple hypertony and hypotony the application of a protective bandage was all that was necessary. As glaucoma may develop in any case it was inadvisable to use mydriatic. The indication for the administration was not clear. Patients were

warned against exertion for one week as severe hemorrhage has occurred with serious damage to vision.

In many cases an attack of acute glaucoma was favorably influenced by pilocarpine and physostigmine or, if these did not suffice, paracentesis of the anterior chamber gave good results. If this was not adequate iridectomy was indicated, iridectomy was preferred in older patients.

It was difficult to outline a definite course of treatment because the cases in which the result of treatment was unfavorable were also the cases in which injury was most serious. The operations for glaucoma may be tried in turn as conditions indicate.

EDWARD S. PLATT, M.D.

EAR

Nielsen J. M. and Courville C. B. Intracranial Complications of Orogenous Thrombosis of the Lateral Sinus. *Ann. Otol. Rhinol. & Laryngol.* 1937 46 1.

The authors state that the intracranial complications of orogenous thrombosis of the lateral sinus are usually due to venous obstruction or to retrograde extension of infection into the afferent vessels and from there into the meninges or brain. The anatomical arrangement of the intracranial venous system accounts largely for the distribution and character of many of these lesions.

The intracranial lesions which may follow thrombosis of the lateral sinus may be benign and transitory as local edema of the meninges and the brain or serous and reactive as meningitis or they may be malignant and often fatal as subdural abscess or hemorrhage, septic meningitis, inflammation extending into other venous channels with red softening, so-called non-suppurative encephalitis, or abscess formation.

All focal lesions such as edema, red softening and subdural or encephalic abscess, may be found in almost any part of the intracranial space because of the communications in various parts of the venous system.

In most of the fatal cases of orogenous thrombosis of the lateral sinus some other intracranial lesion is found at autopsy. These lesions may be coincidental, developing as a result of extension along some other path from the middle ear or consequential due directly to the thrombus in the lateral sinus.

Transitory cerebral or cerebellar symptoms result from stasis in the local veins as local edema of the cortex or meningitis from non-infected thrombosis or red softening or from infected thrombosis or septic meningitis and subdural or encephalic abscess of these veins.

Transitory symptoms may follow abrupt or operative occlusion of the lateral sinus or jugular vein if there is no pre-existing thrombus in the sinus.

The character and location of a localized meningeal and cerebral lesion is determined by a study of

the neurological symptoms and signs, and a survey of the clinical course of the lesion.

JAMES C BRASWELL, M D.

MOUTH

Edling, L.: Recent Results from Teleradium Irradiation of Buccal and Jaw Carcinoma at the Clinic of Radiology in Lund (Bisherige Resultate von Teleradiumbestrahlung beim Buccal- und Kieferkarzinom an der radiologischen Klinik in Lund) *Acta radiol*, 1937, 18 97

During the last ten years irradiation therapy has become the method of choice in the treatment of oral carcinoma. It presents certain difficulties.

1. In case of carcinoma of the cheek there is danger of overdose on account of the thinness of the soft tissue, this may result in disintegration

2. In case of carcinoma of the mandible the carcinoma develops in the thin gingiva bordering the radiosensitive periosteum. Too large doses of treatment may lead to bone necrosis, especially in the presence of gingival or dental infection

3. As regional metastases occur early in oral carcinoma a permanent cure is not obtained very easily. The material was therefore placed in three groups. Group 1, cases without palpable metastases, Group 2, cases with palpable, but movable metastases, and Group 3, cases with fixed metastases

From 1925 to 1935 the following cases received treatment

Thirty-eight cases of carcinoma of the cheek. Of this group 22 (57.9 per cent) occurred in men, and 16 (42.1 per cent) occurred in women. Twenty-six of the patients were between fifty-one and seventy years of age. Sixteen cases belonged to Group 1, 9 to Group 2, and 13 to Group 3. In sixteen cases the carcinoma was small, in 10 it included practically the entire buccal mucosa, and in 12 it involved neighboring structures, such as the alveolar process. Of the 38 patients, 12 (31.5 per cent) were cured, 8 in Group 1, 3 in Group 2, and 1 in Group 3. Two more patients were cured, but they died from other diseases after four and one-half and one and two-thirds years. There were 22 five-year cures of which 7 (30.8 per cent) were permanent

Forty-one cases of mandibular, or gingival, carcinoma. Of this group 33 occurred in men and 7 in women. Nine were from fifty-one to sixty years of age, 9 from sixty-one to seventy years, and 18 from seventy-one to eighty years. Sixteen cases belonged to Group 1, 17 to Group 2, and 8 to Group 3. Nine (22.5 per cent) were cured, 6 in Group 1, and 3 in Group 3. Two others were cured, but they died of other diseases after three and one-half and three and two-thirds years. In four cases the tumors were small, in 18 they involved five or six teeth, in 18 they involved the entire half of the jaw, the floor of the mouth, or the tongue. In 26 of these cases there were only three (11.5 per cent) five-year cures. The writer believes this poor showing was due to the advanced age of the patients, the large size of the

tumors, and the many regional and often inoperable metastases

The treatment consisted of teleradium combined with other measures, such as roentgen therapy, electro-endotherapy, surgery, and intubation with radium needles. Many of the cases were so far advanced that in other clinics they would not have been accepted for treatment. KURT H THOMA, M D

NECK

Quervain, F. de, and Giordanengo, G.: Acute and Subacute Non-suppurative Thyroiditis (Die akute und subakute nichteitrige Thyreoiditis). *Mit a d Grenzgeb d Med u Chir.*, 1936, 44: 538

The authors report eight new cases of acute or subacute non-suppurative inflammation of the thyroid gland showing the histological characteristics which were first described by de Quervain in 1904. These characteristics were hyperplasia, desquamation and degeneration of the epithelium, alteration in character and disappearance of the colloid, infiltration of polynuclear leucocytes, small round cells, and larger cellular elements into the follicles, production of foreign body giant cells around unresorbed colloid cells, appearance of connective-tissue organization, and participation of the interstitial tissues which varied in the individual case. In three cases there was newly formed connective tissue recalling Riedel's form of inflammation of the thyroid gland. In five instances the thyroid findings were simply those of inflammation. In two cases the thyroid had undergone a mild, diffuse enlargement, and in one case there was a suggestion of nodule formation in addition to the inflammatory changes. In no case had purulent breaking down of the tissues occurred. A mild grippe was the causative factor in three cases. As a rule, acute non-suppurative inflammation of the thyroid may be cured spontaneously with alleviative treatment with preservation of thyroid function. Of sixty-two cases only two developed myxedema. Myxedema developed more frequently in cases of so-called lymphadenoid struma. In seven cases Basedow's disease developed later. When operation was performed it was done because the infective process was too slow in regressing or because malignant disease could not be excluded on account of the retarded disappearance of the infection. So long as malignancy is not determined histologically the operative treatment should be conservative. Should thyroiditis be diagnosed at operation, an attempt should be made to hasten regression of the process by means of a partial excision. In the subacute or chronic stage the inflammatory process which is associated with giant cells may lead to the development of connective tissue resembling that found in Riedel's thyroiditis. It remains for the future to determine if the clinical conception of Riedel's disease represents a special histological process or merely a term for the dense growth from thyroid inflammation of varied origin and histological character (T NAEGLI). JOHN W BRENNAN, M D

Kimball O P. The Prevention of Goiter in Michigan and Ohio. *J Am M Ass* 1937 108 860

It has been demonstrated that salt can be iodized accurately and that a high standard of efficiency can be maintained. Iodizing salt has proved to be the least expensive and most satisfactory method devised to supply deficient food iodine in endemic goiter districts.

This survey shows conclusively that the general use of iodized salt is an efficient and safe method of goiter prophylaxis. The study in Houghton County, Michigan, shows that the discontinuance of iodized salt was followed by a marked increase in the incidence of goiter within three years.

Every state in which goiter is endemic is advised to meet the deficiency of food iodine by the general use of iodized salt. It is advisable to have the state health department laboratory analyze every brand of iodized salt every other year at least, and insist on a high standard. An accurate stable product can and should be maintained. It is also necessary that the health department continue its advice on goiter prophylaxis at frequent intervals. Otherwise, interest in this measure will die because of the ease and simplicity of prevention. Attempts to interest and educate the public need not be aimed solely at the deformity of the neck. The number of cases of feeble-mindedness resulting from the cretinoid type of goiter should be emphasized as well as the many cases of clinical hypothyroidism, cretinism and myxedema and the thousands of large tumorous goiters, each of which is a sequel of endemic goiter.

SAMUEL KAHN, M.D.

Saxer P. Injuries of the Larynx and Their Consequences (Unfallverletzungen des Kehlkopfes und ihre Spätfolgen). 1936 Zurich Dissertation.

In this discussion the author adheres quite closely to the well founded summary of Marschik in Text

book No. 3 on Therapy of the Throat etc. by Deaker and Kahler.

Since the publication of this work by Marschik in 1925, up to 1934 reports of 35 cases of injury of the larynx have appeared in the *Zentralblatt für Hals- und Heilk.* The injuries specified were 1 commotio laryngis; 3 contusions; 8 fractures; 1 wound and 2 scaldings.

The author then reports extensively on 28 injuries of the larynx occurring during the period from 1927 to 1935. There were 11 contusions; 14 fractures; 2 wounds and 1 burn. In 7 cases death occurred; in 5 from fracture; in 1 from a wound and in 1 from a burn with erysipel.

The prognosis of larynx injuries as far as life is concerned is favorable, but in regard to later functioning of the larynx it is unfavorable. Six injuries resulted in permanent disturbances.

(GERLACH) CLARENCE C. PEED, M.D.

Blegvad N R. The Problem of Early Laryngeal Tuberculosis. *J Laryngol & Otol* 1937 51 151

The experience gained in the diagnosis and treatment of early laryngeal tuberculosis is based on 1773 cases at the Oeresunshospital in Copenhagen and in the Boserup Sanatorium and covers a period of eighteen years. The absolute diagnosis of tuberculosis of the larynx as differentiated from that of syphilis and malignancy of that organ has not yet been reached so that biopsy and the blood Wassermann tests are still essential for the diagnosis.

The author's criteria in the diagnosis of tuberculosis of the larynx are (1) isolated redness of a vocal cord; (2) swelling and redness of the vocal process; (3) prolapse of the ventricle of Morgagni; (4) swelling of the lower surface of the vocal cords; (5) swelling of the mucous membrane in the arytenoid region; and (6) a red cushion beneath the commissure.

RICHARD J. BENNETT, JR., M.D.

SURGERY OF THE NERVOUS SYSTEM

BRAIN AND ITS COVERINGS; CRANIAL NERVES

Koebcke, H : Angiography of the Vessels of the Brain (*Die Angiographie der Hirngefäße*) *Deutsche med Wchnschr*, 1936, 2 1874, 1915

The establishment of visibility by contrast-filling of the arteries of the brain for roentgenograms was done first by Moniz in Lisbon with sodium iodide and was reported in 1931 at the Congress of Neurologists in Bern. Owing to the danger of sodium iodide the method met with scant approval. Other objections that were advanced were that the technique was not simple enough, the interpretation of the plates was too difficult and too uncertain, and only the arteries of cerebral hemispheres could be ascertained. All of these objections were partly overcome after the introduction of thorotrast as a contrast agency by Loehr and Jacobi, and by the experience gained subsequently from the frequent use of this method. Arteriography, more than any other method, has contributed greatly to our knowledge of the vascular malformations in the brain. One of the main advantages of arteriography, as compared with those of other diagnostic methods employed in the study of brain lesions, is that it is absolutely safe. No accident nor injury has been reported since the introduction of thorotrast.

The indications for employing arteriography in brain surgery are:

- 1 Suspected brain tumors that cannot be diagnosed clinically nor by roentgen ventriculography. These cases occur most commonly in patients whose ventricles for some cause or other cannot be filled with air. Loehr always uses arteriography together with ventriculography as a "combined encephalo-arteriography."

- 2 Cases of brain tumors with very high pressure that appear too dangerous to permit encephalography.

- 3 Epilepsy of uncertain etiology, especially if it occurs after the patient is thirty years of age and if aneurysm is suspected. This is the main indication.

For the neurologist arteriography is also important for the study of vascular diseases of the brain, for establishing the effect of hemorrhages and inflammations upon the vascular elasticity, for studying the marked changes in the circulation of the blood through the brain caused by the changes in the caliber of the larger vessels following diseases of these vessels, and for studying the embolic displacements of the carotids and of the larger vessels in the brain as well as those caused by vascular diseases due to trauma.

When the sodium-iodide contrast method was used it was demonstrated repeatedly that the brain pressure was reduced and the attacks of headaches

and emesis became less frequent. Occasionally epileptic attacks also were reduced in frequency after arteriography. Interesting conclusions as to the rapidity of the circulation of the blood within the brain were also gained by means of this procedure. It is assumed that the blood flows more rapidly through the brain than through any other part of the body. This conclusion was reached by Moniz who found that any drug in the circulation not forming a distinct cellular combination during its first round will travel through the brain several times in the time that it takes to travel through the other organs of the body once. Loehr's technique of arteriography as done by Olivecrona of Stockholm is described accurately by the author. This must be read in the original as there are many important details which vary according to the location of the vessels involved.

For the diagnosis of brain tumors it is significant to recognize any special displacement of the blood vessels within the tumor area as well as any displacement of the artery that influences its course or caliber. If a special vascularization exists, then there is also a malposition of the arteries. This was noted particularly in the groups of the sylvian vessels, the branches of the carotid artery, and the arteria pericallosa. The circulation of the blood stream through the vessels in a brain tumor is slower than through the vessels of the normal brain. The contrast medium is seen in the vessels within the tumor, while it has disappeared from the arteries in the rest of the brain, but it is still present in the veins. To witness this condition two exposures are necessary—an arteriogram and a phlebogram. A study of the special vascular displacements within a tumor as shown in the arteriogram will aid in the classification of such a tumor. The meningiomas, the vascular astrocytomas, and the pinealomas have characteristic vascular displacements. Numerous sketches and photographs of arteriograms illustrate the previous statements. It requires extensive practical experience and close application to master this method, but when it is sufficiently mastered, correct diagnoses can be made.

(BODE) MATHIAS J. SEIFERT, M D

Dandy, W. E.: Ménière's Disease. *J. Am. M. Ass.*, 1937, 108 931

In 1933 Dandy showed that arterial contacts with the bare sensory root of the trigeminal nerve in the posterior cranial fossa were responsible for most cases of trigeminal neuralgia. As attacks of Ménière's disease are analogous to attacks of trigeminal neuralgia, Dandy thought that possibly a similar factor might be the cause of many cases of Ménière's disease. Of the cases of Ménière's disease he operated on during the past year, about 10 per cent showed contacts of the eighth nerve with large

arteries. In addition there were many vessels of smaller size that doubtless produced the same effect.

DAVID J. IMPASTATO, M.D.

Monnier, M. The Value of the Aschheim Zondek Reaction in the Diagnosis of Brain Tumors (*La valeur de la réaction d'Aschheim Zondek dans le diagnostic des tumeurs cérébrales*). *Presse méd.* Par. 1937 45 412.

Inasmuch as the Aschheim Zondek test as used in the practice of obstetrics and gynecology is indicative of the functional state of the hypophysis Monnier believes that the reaction should also give information about the functional state of the neighboring parts of the brain and he is using the test in the study of certain types of brain tumors.

His tests were made by injecting prepubertal virgin mice with the urine, blood, or cerebrospinal fluid of patients with brain tumors. All of his tests were checked by control animals. He used dilutions of 1 $\frac{1}{4}$, $\frac{1}{8}$, and $\frac{1}{16}$ mouse units, a mouse unit being the minimal dose of blood, urine, or cerebrospinal fluid containing gonadotropic hormone which is necessary for the luteinization of ovarian follicles. He believes that even very small amounts of the hormone as little as $\frac{1}{16}$ mouse unit, may indicate the different functional activation phases of the hypophysis and its related diencephalic structures.

Among all brain disturbances those most likely to be indicated by the Aschheim Zondek reaction are cerebral lesions, especially tumors located in the mid brain or frontal fossa. The author found a positive gonadotropic reaction in his mice in 50 of 100 cases of cerebral tumors, and in these 50 cases the histological effects of the injection of urine or ventricular fluid on the genitalia of both male and female mice did not exceed in intensity the effects of Phase I of the standard Aschheim Zondek test. Contrary to what might be supposed, cerebrospinal fluid obtained either by lumbar puncture or direct ventricular tapping does not contain more of the gonadotropic hormone than the urine of the tumor patient.

Monnier believes that the positive gonadotropic reaction has a definite practical value in neurology as it signifies that the anterior hypophysis is in a state of functional irritation. This irritation depends less on the intracranial hypertension itself than upon the location of the tumor or inflammatory area which causes the hypertension. The reaction

depends also on the stage which the cerebral disease has reached. The gonadotropic reaction is positive when the tumor has not yet destroyed the connections between the hypophysis and the brain, i.e. when these frontal or mid brain lesions are at an early stage.

JOHN MARTIN, M.D.

SPINAL CORD AND ITS COVERINGS

Oppenheimer, A. and Turner, E. L. Discogenetic Disease of the Cervical Spine with Segmental Neuritis. *Am. J. Roentgenol.* 1937 37 484.

The authors made an intensive study of the roentgenological appearance of the cervical spine as the possible source of referred pain to the shoulder girdle. Attention was called to the cervical spine as the possible cause of the pain because of several cases with unilateral atrophy of the deltoid which suggested a segmental neuritis. A review of the general roentgenological changes commonly found in the spine was given. In the cases mentioned there was no past or recent evidence of infectious arthritis despite clinical symptoms of this disorder which were fully developed. It was found that a thinning of the intervertebral discs caused unilateral or bilateral narrowing of the corresponding intervertebral foramina which resulted in compression of the nerve roots. The most common localization was found to be the lower cervical region, especially between the fifth and sixth and sixth and seventh vertebral bodies. The symptoms were those of discomfort and muscular weakness of the upper extremities as well as pain in the precordium or the shoulder girdle. Although the articulating facets were displaced the intervertebral joints did not show roentgenological signs of arthritis. Lipping and spiculation when present were limited to the vertebral bodies, especially those adjacent to the thinned discs and were not found in the intervertebral joints. The lesion is usually located in the cervical spine and is occasionally associated with prolapse of the nuclei pulposi in the lower segments.

The authors conclude that primary thinning of the intervertebral discs regardless of its origin is a common disease which may often account for insistent symptoms that are clinically obscure. The authors have adopted the term discogenetic disease as descriptive of these conditions.

ROBERT ZOLLINGER, M.D.

SURGERY OF THE THORAX

CHEST WALL AND BREAST

Margraf, C.: Roentgen Irradiation in the Treatment of Puerperal Mastitis (Die Stellung der Roentgenbestrahlung in der Behandlung der puerperalen Mastitis) *Strahlentherapie*, 1936, 57 303

The author reports his own experiences with x-ray therapy of puerperal mastitis, which has been employed at the Wuerzburg Clinic since 1926. Before the treatment the breasts are emptied by pumping. At each treatment 115 Or, 14 per cent of the skin erythema dose, is administered. The same dose is repeated in forty-eight hours if the inflammatory reaction has not receded, and a third dose is given in ninety-six hours if necessary. The success of the treatment depends, as the table in the original article shows, upon the early administration of the treatment, i.e., treatment during the first twenty-four hours. The affected breast is tied up high for twenty-four hours after the treatment and alcohol dressings are applied for from one to two days. To avoid enteral infection the milk is boiled even in mild cases before it is given to the baby.

Incision was necessary in only 29 per cent of 127 conservatively treated patients, and in only 8 per cent of the patients who were treated early. The duration of the disease in cases of mastitis with abscess could not be shortened by a previous irradiation nor by a later irradiation. In 75 per cent of the patients a sudden drop of the temperature occurred within twenty-four hours, and in 25 per cent there was a gradual drop in the temperature. The subjective symptoms disappeared simultaneously. A decrease in the secretion of milk was not observed after irradiation therapy. The decreased secretion during the involvement of the breast is considered the result of the generalized poor condition.

The economic advantages of irradiation are emphasized especially, the much shorter course of the irradiation therapy is contrasted with the more uncertain methods of treatment which frequently lead to abscess formation.

(KARL KOCH) LEO A. JÜHNKE, M.D.

Hicken, N. F., Best, R. R., Moon, C. F., and Harris, T. T.: The Pre-Operative Visualization of Breast Tumors *J Am M Ass*, 1937, 108 864

Tumors of the breast can be visualized by contrast roentgenograms made by introducing radio-opaque substances into the milk ducts or by inflating the breast tissues with air.

Tumors arising within, or communicating with, the milk ducts are best visualized by introducing stabilized thorium dioxide sol into the diseased ducts. The stereoscopic mammograms make it possible to locate the tumor and portray its identifying characteristics.

Tumors in the periductal tissues, or those with no communication with the milk ducts, can be visualized by inflating the breast with air. A large encapsulated lipoma was visualized with this method.

A combination of the ductal injection and the insufflation of air produces the most satisfactory visualization of the structures of the breast.

Lipomas, fibro-adenomas, simple retention cysts, cystic degeneration of the ducts, and carcinoma are some of the lesions that have been visualized pre-operatively and diagnosed correctly.

SAMUEL KAHN, M.D.

Gershon-Cohen, J., and Colcher, A. E.: Roentgen Diagnosis of Early Carcinoma of the Breast. *J Am M Ass*, 1937, 108 867

Roentgenographic examination of the breast is a more useful diagnostic procedure than is generally appreciated. It is more accurate than macroscopic inspection of sections. A remarkably high percentage of roentgen diagnoses have been proved correct by histological studies, and this number can be increased if the examination is carried out more carefully and uniformly. Early malignancy can be determined very frequently, especially in the fat and postlactation breast.

If periodical examinations of normal breasts were carried out in women past twenty-five years of age, a much more effective campaign against carcinoma of the mammary gland could be carried out, because early malignancy is readily determined. The examination can be done easily and at so little expense that it is entirely practicable from these standpoints. It is even possible that the therapeutic effect on the breasts of many endocrine substances may be revealed more graphically by the roentgen examination than by any other practical clinical method now available.

SAMUEL KAHN, M.D.

Ratti, A., and Picchio, C.: Radiotherapy of Cancer of the Breast (La radioterapia del cancro della mammella) *Tumori*, 1937, 23 84

There are many problems of a clinical and technical nature in the treatment of cancer of the breast that still remain unsolved. These are discussed in detail. After reviewing the clinical classification of the different stages of cancer, accepting in a general way Steintal's classification, the authors discuss the indications and contra-indications of radiotherapy of cancer of the breast. They conclude that surgery should be used in all cases that are completely operable, not excluding cases in which there are late axillary-gland metastases that are still mobile and not accompanied by other signs of the disease.

A large field for the use of radiotherapy still remains in the inoperable cases, the frequent local and gland recurrences, and even bone metastases. The authors advocate the use of postoperative irradiation.

as it seems to have improved the results in the treatment of cancer of the breast

They describe the technique to be used in the roentgen and radium treatment of these tumors and with regard to the latter emphasize especially the technique of using radium needles and molds as taught by the Milan school

They review the statistics reported in the world literature and report their own results in 122 cases of local recurrence and lymph gland metastases treated between 1928 and 1933. Thirty six of the patients were lost to sight for various reasons which left a balance of 86 that have been followed up. Of these 6 or 7 per cent are living and well, 17, or 19.8 per cent, are living but show signs of recurrence or metastasis and 63 or 73.2 per cent, are dead.

The results seem poor but in view of the very unfavorable nature of the material they are encouraging. Some patients were really saved others had their lives prolonged and their pain and distress alleviated. There should be the closest cooperation between the surgeon and the roentgenologist in order that the best combination of treatment may be planned for each individual case. AUDREY GOSS MORGAN, M.D.

TRACHEA LUNGS, AND PLEURA

Schulze G. Bullet Wound Injuries of the Lung Sustained During the War and Their Consequences (Kriegslungenschussverletzungen und ihre Folgen). 1936. Cologne Dissertation.

This is a detailed article based on the literature not including the official military medical reports and the statistics of Franz. The mortality of injuries to the lungs is given as 50 per cent. Hamermann reported deaths from bleeding during the first three days following infantry bullet wounds in 40 per cent of the patients and following wounds due to hand grenades and mines only in 20 per cent. Of 265 patients who died 40 per cent died during the first two days and 60 per cent during the first seven days. Gayer found that of 225 suffering from penetrating gunshot wounds of the chest only 50 per cent were able to reach the front line first aid station alive, 22 per cent died before reaching the main first aid station, 8 per cent died before being transferred to the field hospital and 3 per cent died upon reaching their homes. The majority of those who survived were cured and had no residual symptoms or they had only minor complaints. The relation between these injuries and tuberculosis is carefully discussed. Such association is rare. It is almost completely certain that a bullet wound through healthy lung tissue is incapable of causing tuberculous infection. It is somewhat different however when the bullet passes through a latent tuberculous focus. Pleural calcifications are frequent and the so called armor pleura is not infrequently observed. The symptoms are remarkably slight. Calcifications may begin after only a few months but for the most part they first make their appearance after a period of years. Calcifica-

tions of the bullet sinus are rare. The development of cancer fourteen years following a hand grenade splinter wound was seen only once. It was reported by Lukow. Ruptures of the diaphragm are not an infrequent occurrence. They may exist for years without causing symptoms and then suddenly lead to an incarceration. Gastric complaints frequently precede the incarceration. Early operation is indicated because according to Nobe of 59 operated cases 38 ended fatally. Bronchiectasis is not at all rare, under certain indications such as fetid expectoration and fever, it should be treated surgically. Gunshot wounds of the lung in which the missile remains embedded are very frequently completely symptomless. They must be operated upon, however, if they show a tendency to hemorrhage or abscess formation as frequently occurs after a number of years have passed. Lead poisoning is very rare.

The author's own material consists of 83 cases of these 19 were simple through and through gunshot wounds, 48 were cases in which the missiles lodged within the lungs. The missiles were gunshot grenade splinters and shrapnel. In 9 cases of the latter group the foreign bodies were removed immediately and in 2 they were removed later. Forty five of the patients earned the missiles free in the lung tissue which fact was demonstrated roentgenologically. In 5 cases the missiles were surrounded by scar tissue.

There were no symptoms in 1 case and mild symptoms in 74 cases, the lungs were completely clear in 26 cases. Pulmonary tuberculosis was found in 11. In only 5 of the last the tuberculosis was recognized as being secondary to the gunshot wounds. Bronchiectasis was found in 7 cases. Pulmonary gangrene in 1 case. Diaphragmatic hernia in no case. Pleural thickening in 30 cases. Pleural calcification in 5. Complete immobility of the diaphragm with armor pleura in 1. Calcified bullet sinus in 1. Limited diaphragmatic mobility in 35. Considerable shrinking of the lungs in 3. Marked pulmonary infiltration in 9. Milder pulmonary infiltration in 11 and chronic bronchitis in 9.

(FRANZ) HARRY A. SALZMANN, M.D.

Weber P. Primary Tuberculosis of the Apex and the Territorial Conception of the Structure of the Lung (La tuberculose primitive du sommet et la conception territoriale de la structure du poumon). *Arch. méd.-chir. de l'appar. respir.* 1936. 11: 479.

Weber notes that there has been considerable difference of opinion especially between French and German physicians in regard to defining the apex of the lung and the most frequent site of the primary lesions of tuberculosis. These differences are more apparent than real and result chiefly from the multiplicity of terms employed to designate the upper portion of the lungs which is the site of election of tuberculosis.

The author in his studies has found that the apex is not merely the highest portion of the lung but is a

definite anatomical territory which has its own bronchial and vascular supply. This territory is sometimes clearly delimited by a supernumerary fissure or partial fissure. The plane of this fissure is not horizontal, it extends obliquely into the parenchyma from the outer and upper surface downward and inward.

The apex of the lung, thus conceived, includes a lower portion of the lung which is intrathoracic and has a base delimited by the projection of the second rib on the pulmonary cortex, and an upper portion which projects above the thoracic cage.

This territory of the apex is more clearly defined radiologically from the lateral view than from the usual anteroposterior view. In a lateral roentgenogram tuberculous lesions can be definitely localized in the territory defined as the apex in most cases. Their localization as established by auscultation also corresponds with this territory of the apex.

Clinically, a distinction can be made between tuberculosis involving the upper portion of the apex, which is usually benign, and tuberculosis involving the lower, intrathoracic portion of the apex, which usually advances more rapidly. This is to be explained by the fact that the intrathoracic portion of this apical region is one of the more active portions of the lung in the respiratory and circulatory processes; while the upper part of the apical region is shut off from the more active participation and its respiratory movements are limited. Cavities appear usually in the lower portion of the apex, cavities of the upper portion of the apex are extremely rare.

ALICE M MEYERS

Lilienthal, H: Conservation of the First Rib in Apicolytic Thoracoplasty. *J. Thoracic Surg.*, 1937, 6: 414.

Lilienthal describes a method for securing marked local compression of the apex of the lung by combining extrafascial packing with a partial thoracoplasty. The first rib is preserved but the lung with its overlying soft tissues is separated from it. A rubber dam is packed into the dead space and, because of its elastic spreading, the amount of compression is increased during its stay of from four to five days. Following removal of the rubber dam the cavity is allowed to fill with granulation tissue. The preservation of the first rib aids in keeping the packing in place, minimizes the danger of injury to the important vessels and nerves, and may decrease the amount of thoracoplastic scoliosis. Four cases are reported in which this operation was used.

RICHARD H MEADE, JR., M D

Dargent: Experimental Researches on Pneumonectomy, Particularly on Its Immediate and Late Results (Recherches experimentales sur la pneumectomie et en particulier sur ses repercussions generales, immediates et tardives) *J de chir.*, 1937, 49: 221.

Observations were made on various vital functions during pneumonectomy in seventeen rabbits and

twelve dogs. Both immediate and late studies were made.

Ligation of the pulmonary artery had little effect on the arterial pressure, and the heart action showed no significant change except momentary extra systoles. Traction on the great vessels and manipulation of the pericardium near the caval opening caused the greatest changes in the heart action, a fall in the arterial pressure, but it caused no change in the pressure within the contralateral pulmonary artery.

In the performance of pneumonectomy it is recommended that the branches of the pulmonary artery be ligated separately rather than that the artery be ligated itself. The importance of gentle handling of the tissues and avoidance of traction on the structures of the hilum is emphasized.

RICHARD H OVERHOLT, M D

Burnett, W. E.: One-Stage Pneumonectomy Under Local Anesthesia: Successful Case Reported. *J. Thoracic Surg.*, 1937, 6: 458.

A left pneumonectomy was successfully carried out in a child of eight years of age. The operation was done under local anesthesia. In addition to preliminary intercostal nerve block, infiltration was done in the region of the inferior pulmonary ligament, the phrenic nerve, and the hilum. A topical application of novocain to the mediastinal pleura was made. A 1 per cent solution was used except for the continuous infiltration, for which a 0.5 per cent solution was employed.

The case reported is unusual in that a chronic emphysema complicated the extensive bronchiectasis for which the operation was done.

The incision for pneumonectomy was made above the site of the previous thoracotomy. Mass ligatures were placed about the hilum with the aid of tourniquets.

RICHARD H. OVERHOLT, M D

Bremer, J. L.: The Fate of the Remaining Lung Tissue After Lobectomy and Pneumonectomy. *J. Thoracic Surg.*, 1937, 6: 336.

The permanent result of lobectomy or pneumonectomy may be either simple distention of the remaining lung tissue by dilatation of the alveoli and respiratory units, or true regeneration by means of new growth of normal alveoli and respiratory units, marked by the presence of tubular sprouts indicating normal growth.

Regeneration occurs in the young; dilatation in those whose lungs have ceased growing. The latter condition is usually found in the adult, but in the rat and probably in other rodents, normal growth continues almost throughout life. In adults of these animals regeneration of the remaining lung is to be expected.

Dilatation of the alveoli gives only a little more respiratory surface than the original lung, only so much more as might be added by lengthening the alveolar walls. Physiologically, the dilated lung may be at a disadvantage as the air is not so finely divided and there is a lower ratio of air surface to air

bulk. Compensation may be made by the increase in the vascular bed brought about by the passage of all the blood from the right heart through the remaining lung tissue. However the dilated condition can be regarded only as a makeshift, not as a complete recovery from the operation such as occurs in regeneration of the lung tissue.

RICHARD H. OVERHOLT M.D.

Christie A. C. The Diagnosis and Treatment of Primary Cancer of the Lung. *Brit J Radiol* 1937 10 141

Cancer of the lung now accounts for from 5 to 10 per cent of all carcinomas found at autopsy presenting about the same frequency as cancer of the rectum.

It is now well established that primary cancers of the lung are all bronchiogenic in origin whether they originate from cells lining a bronchus from cells lining the mucous glands or from cells of the pulmonary alveoli. The histological classification which is now quite generally accepted divides these tumors into adenocarcinoma, squamous cell carcinoma and undifferentiated carcinoma. They all have a very high rate of metastasis.

Symptoms are cough, pain in the chest, dyspnea and hemoptysis in the order named. A localized pneumonitis due to obstruction by the tumor may cause fever.

Physical signs are of little value in early diagnosis. The roentgenological examination is of most importance in connection with bronchoscopy when a piece of the tumor may be obtained for biopsy.

Cancer of the lung may have to be differentiated from bronchiectasis. This may be impossible except by biopsy. A cavity in the tumor may be mistaken for a chronic lung abscess. Dermoid cysts and thymomas may simulate cancer of the lung. Pleural effusion may be malignant in origin. Mediastinal Hodgkin's disease will disappear after relatively small doses of irradiation.

Treatment by pneumonectomy is based upon a few established cures. At present recognized contraindications to operation are wide local extension with involvement of the mediastinum, glandular or distant metastases, the presence of pleural nodules or extensive pleural adhesions, the involvement of the carina or extension into the trachea or the bronchus of the opposite side.

Radiotherapists everywhere should be encouraged to seek extension and improvement of the method for the treatment of otherwise hopeless cases of bronchiogenic carcinoma. At present more cures can be obtained only with earlier diagnosis.

GEORGE A. COLLETT M.D.

Fabris A. Primary Epithelioma of the Lung (l'epithelioma primitivo del polmone). *Tumori* 1917 23 19

This is a report from the Anatomopathological Institute of the Hospitals of Venice. During the period from January 1, 1928 to June 30, 1936 8,463 autopsies were performed and among them were 163 cases of primary cancer of the lung. The percentage of cases of cancer of the lung to total autopsies increased each year except 1934. In 1928 it was 0.71 per cent and in the first half of 1936 3.36 per cent. A thorough histological examination was made in 106 cases. The histological findings are discussed in detail and typical cases of each group are described.

The majority of the tumors were of epithelial origin. A small undifferentiated cell was the fundamental type of tumor cell. It resembled a sarcoma cell to such an extent that it might very well have led to mistaken diagnoses. The tumors were divided into microcytomas or pseudosarcomas which contained large numbers of these small cells and constituted 39 per cent of the cases, epitheliomas which contained transition cells and made up 33 per cent of the cases, epitheliomas containing differentiated cells and classified according to the degree of maturity and direction of differentiation as tumors with pavement cells which made up 10 per cent of the cases and epitheliomas with prismatic and mucoparous cells which made up 7 per cent of the cases. Little relationship could be seen between the histological pictures and the clinical and macroscopic appearance.

Many so-called mediastinal tumors are doubtless secondary to lung tumors.

WILEY GOOS MORGAN M.D.

MISCELLANEOUS

Andrus W. DeW. Tumors of the Chest Derived from Elements of the Nervous System. *J Thoracic Surg* 1937, 6 181

The thorax contains nerves of both the somatic and the autonomic systems and in addition many ganglion cells of the paravertebral ganglionic chain and of the cardiac and pulmonary plexuses.

The author sets up a chart of derivation of the various elements which make up the nerve structures found in the thorax. He points out that such a chart includes the type cells of practically all tumors derived from elements occurring in the chest wall or within the thorax. The more embryonic the type of cell the more malignant the tumor.

The author presents several typical case histories of various tumors of the chest derived from elements of the nervous system.

EARL O. LATIMER M.D.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Hicken, N. F., and Best, R. R. Pyo-Umbilicus Associated with Umbilical Concretions *Ann Surg*, 1937, 105: 539

Palliative treatment of recurring pyogenic infection of the umbilicus is futile. The predisposing factor is a stenosing of the cutaneous umbilical orifice with the accumulation of sebaceous material and other debris with the formation of a concretion.

An abscess may form and burrow deeply even into the peritoneum. Injection of the umbilical tract with lipiodine will visualize the foreign body and associated disease, such as a patent urachus. Excision of the tract during a period of quiescence is the treatment of choice. Four cases of pyo-umbilicus are reported.

GEORGE A. COLLETT, M.D.

Harmon, P. H., and Harkins, H. N.: Peritonitis I. The Effect on Blood Pressure of the Peritoneal Content in Suppurative and in Bile Peritonitis. II. The Effect on Blood Pressure of Protein-Free Extracts of the Peritoneal Content and of Filtrates from Pure Cultures of Bacteria *Arch Surg*, 1937, 34: 565, 580

The authors' experiments demonstrate the presence of a vasodepressant toxin in the peritoneal cavity coincident with the development of suppurative peritonitis. A definite time is required for the development of this toxic product. The toxin or toxins seem to develop earlier when the open intestinal segment is placed high in the gastrointestinal tract, where the opportunity for soiling the upper portion of the abdomen is greatest. The nature of the experiments was such as to rule out effectively the possibility of inherent toxicity of the pancreaticoduodenal secretion, a factor that has been recently demonstrated by Gatch and his co-workers.

The identity of this toxic substance was not fully elucidated. It is highly probable, in view of the variable response obtained on the blood pressure after atropinization, that there is more than one substance involved. Either acetylcholine or a like substance is definitely present in certain of these preparations. The demonstration that these fluids lower the blood pressure in rabbits as well as in dogs is definite evidence that histamine is not the major substance involved. It was also demonstrated that some or all of these vasodepressant substances are filtrable through a bacteria-tight filter, that they are active on absorption from the peritoneum, and that they lower the blood pressure and produce symptoms of weakness and hypermotility of the gastro-intestinal tract in normal unanesthetized dogs.

It is well known that toxic amines can be obtained by extraction in saline solution from practically all

of the body tissues, including the peritoneum, after death. The experiments were performed so as to obtain peritoneal washings many hours and at times even days prior to death from suppurative peritonitis. The question of agonal invasion was thereby avoided. It is noteworthy that cultures for bacteria gave a rich flora from the peritoneum in all the experimental animals. The colon bacillus and a gram-positive spore-forming obligate anaerobic organism resembling the Welch bacillus were invariably found and, usually, staphylococci and streptococci. The question would naturally arise as to whether these micro-organisms produced a vasodepressant toxin in their growth within the peritoneum. This is being investigated further. It is suggested that the colon bacillus or its growth products may be the most important source of this toxic substance as the fluid from experimentally induced bile peritonitis is devoid of a vasodepressant substance even when the entire peritoneal exudate is injected intravenously into a test animal at the stage when gram-positive obligate anaerobic organisms can be cultured easily. However, if death occurs and the peritoneal fluid is removed as soon as a half-hour after death, a vasodepressant toxin is present. At this time the colon bacillus as well as the anaerobe can be cultured.

The similarity of the action of the depressant substance and that of normal fecal material and the contents of the obstructed bowel is striking. A comparison of the author's blood-pressure tracings with those demonstrated by Gatch and his co-workers, who dealt with the latter materials, reveals this marked similarity.

The experiments do not elucidate the exact rôle that these toxic substances play in the fatal decline from suppurative peritonitis. It is generally believed that absorption is slowed-up from an inflamed peritoneum, especially if there is a fibrinous exudate present. When such a substance is present within the peritoneum in large quantities, it is highly possible that some absorption can and does take place. So far as the authors were able to determine from the literature, this is the first adequate demonstration of the association of such a substance with peritonitis; although some relatively insignificant falls in the blood pressure in animals in which the condition developed have been reported by Steinberg and his co-workers, and a "toxic protease" was mentioned by Whipple.

The second set of experiments constitutes an inquiry into the nature and origin of the toxic substance present in the peritoneal cavity in experimental suppurative peritonitis. The experiments demonstrate that the substance is not a protein as it occurs in the filtrate after treatment with trichloroacetic acid. Similar extracts of the centrifugated sediments yielded protein-free filtrates of partic-

ular potency. Such a finding suggests that the cellular abdominal debris, composed of polymorphonuclear phagocytes and adherent material is the most potent part of the substance. Since similar extracts of washed bacteria were strikingly free from a vasodepressant action it appears that the substance is a soluble toxin. Its close association with peritoneal cellular debris may indicate either that the toxin is absorbed by such cells, or that it is a product of them. Tests of the bacteria free filtrates from pure cultures of bacteria were included. Even though the symptoms produced by the soluble specific substance of Steinberg and Ecker have been known for a long time this was the first demonstration showing that the same bacteria filtrate produces a profound vasodepression. It is possible that the symptoms produced by the soluble specific substance are only those due to the low blood pressure. The close relationship of the symptoms to vasodepression is further shown by the fact that both have an appreciable incubation period following injection before they occur. The authors' experiments also demonstrate that certain of the spore forming obligate anaerobes and staphylococci all organisms associated with suppurative peritonitis, produce soluble vasodepressant substances that appear in bacteria free filtrates.

The exact role that these substances play in peritonitis was not elucidated in the experiments. It is not inconceivable that they could contribute to the final fatal decline in this disease.

AARNA S W TOURNEY MD

Scalone I Experimental Pathology of Torsion of the Greater Omentum (*La patologia sperimentale della torsione del grande epiploon*) *Riv di chir* 1937 3 61

All the cases of torsion of the omentum published have been in association with hernia and have presented acute symptoms of peritonitis, appendicitis, occlusion or strangulation of the hernia. There are milder or occult cases in which the symptomatology is not so acute. The author has studied the pathology of these in animal experiments. In one group of experiments he studied torsion of the omentum remaining free in the abdomen in a second torsion with the omentum fixed to the lower part of the abdominal wall so as to reproduce the clinical conditions of the herniated form. In a third the changes in acute strangulation and in a fourth the effect of introducing bacteria into the circulation in cases of torsion of the omentum. The findings are described in detail and illustrated with colored drawings.

He found that torsion of the omentum produces anatomical and functional disturbances of the various abdominal organs from traction and interference with the circulation. These changes are rarely seen by the surgeon as he does not perform extensive exploratory operations. The torsion of the omentum forms a very favorable focus for the development of any bacteria that may be in the blood. Of the six animals inoculated with bacteria while they had tor-

sion of the omentum four died within a few days and the others suffered very severely.

The therapeutic conclusions to be drawn from these experiments are that resection of the omentum must be done above the cord formed by the torsion. In the herniated form the exploration must be extended until complete mobilization of the omentum is obtained. In two of the author's cases traction was required until the transverse colon was brought down into the operative incision and resection was done a few centimeters from the colon. When mobilization cannot be done this way, laparotomy becomes necessary. ANDREW GOSS MORGAN MD

Becker J Malignant Abdominal Tumors (Ueber maligne Bauchdeckentumoren) *Arch f klin Chir*, 1936 187 530

The author reports two cases of malignant abdominal tumor.

A woman of thirty eight years noticed a circular black pigmentation in the skin of the left lower abdomen, which was removed by electrical surgery. Soon a genuine tumor appeared which was removed by an operation and upon microscopic examination revealed no malignancy. About a half year later there was a glandular swelling in the left shoulder and the patient had to be taken into the hospital on account of recurrence of the tumor in the ear, which in time had become two tumors the size of a small apple. The operative removal was quite difficult because the tumor substance had already grown deep into the muscular tissue of the abdomen and had partly extended into the peritoneum. Microscopic examination revealed a sarcoma of large cells with a deposit of pigment. Soon after the operation general metastasis of the tumor developed in the bones and the vertebral column and in three months death occurred.

The second case was that of a sixty two year old woman who had always been in good health and about a year previously had noticed a tumor on her left upper abdomen which was gradually becoming larger. Her physician resorted to conservative treatment and became hopeful when he observed that in spite of the enormous size of the tumor it became solter. The patient was afflicted with myodegeneration of the heart and had to be properly prepared for operation. The large tumor almost degenerated into a cyst was removed along with the abdominal fascia in which it was seated. It was clearly a case of fibrosarcoma with secondary softening and bleeding in the tumor tissue. The patient died soon after the operation from heart failure.

Both tumors had their origin in the abdominal wall. In the first case the malignity remained unrecognized and because of insufficient treatment with electricity the tumor began to grow. It is a question whether the first operation was sufficiently radical. In the second case it is hard to understand why in view of such an enormous growing tumor the physician did not regard immediate surgery imperative. (BOOK) CLARENCE C REED MD

GASTRO-INTESTINAL TRACT

Zorzi, P.: The Buffer Power of the Human Stomach (Il potere tampone [pt] dello stomaco umano). *Arch. ital. di mal. dell'appar. digerente*, 1936, 5 520

The author analyzes and compares the titration curves of the hydrochloric acid solution and the gastric contents when neutralized with sodium hydroxide. The study of the titration curve, he believes, offers a method for measuring the buffer power of the stomach fluids. The author considers the theory of the subject in detail.

Clinical observations were made in about 400 ambulatory patients. These included patients with the gastroduodenal ulcer syndrome, calculus cholecystitis, and other dyspepsias without demonstrable local pathology. Several different types of test meals and aspirations were used to evaluate the titration curves of each. The general average of the buffer action of all the cases corresponded to about 50 units of acidity. A number of illustrative results are given in detail.

The measure of the pH of gastric fluid has been of only theoretical interest up till now, and the buffer power has been ignored by internists, or erroneously interpreted as the combined acid. The author feels that his results tend to establish that a study of the buffer action may be of great practical aid in the study of gastro-intestinal disturbances, especially in relation to the variations of the pH. These measurements are not difficult.

The buffer power corresponds to the differential acidity, or the combined acidity of old denomination. The author has not shown any clinical relationship between the varying buffer power and the different clinical syndromes. As yet a study of gastric carcinoma has not been made.

A. LOUIS ROSI, M.D.

Aschoff, L.: Gastritis: Pathological and Anatomical Studies (Gastritis Pathologisch-anatomischer Teil). *Karlsbad aerztl. Vortr.*, 1936, 15 267

Common gastritis, the irritated stomach of Westphal, may be either acute or chronic. It may occur in various intermediate stages and finally lead to an "umbagastritis," a gastritis which alters the gastric structure. The author has interested himself primarily in the inflammation of the mucous membrane, the endogastritis, when it may involve the submucosa, the muscularis, and the overlying peritoneum. The early histological changes were first observed in surgical specimens. These specimens have shown that the primary process is an acute inflammation of the mucous membrane which is followed by erosion and ulceration, and that neither autodigestive hemorrhages nor obstruction of the blood vessels are responsible for it. First there is a leucocytic invasion by diapedesis in the mucous membrane folds and in the deeper connective tissue, and the superficial layers of the cells become hyalinized and desquamated. The normal gastric juice is practically non-injurious and causes neither ero-

sion nor ulceration, but abnormal gastric juice with a high acidity is very destructive to the antrum when the stomach is empty or after feeding when an esophageal fistula has been established.

Histamine, morphine, pilocarpine, and caffeine act through the circulation and nicotine acts directly to increase the secretion of gastric juice, especially in people of nervous temperament.

The spontaneous erosive gastritis may occur at times in the corpus and not involve the lesser curvature on account of the vomiting, and at other times it may involve precisely the region about the pylorus, the magenstrasse.

The fact that only isolated areas and not the entire gastric surface become involved is due to the marked folding of the mucous membrane. At times dietary indiscretions are equally as injurious as hunger. Erosions become chronic and finally ulcerate most easily in areas where the mucous membrane folds are low, narrow, and tense, so that not only the gastric juice but also mechanical trauma may become more effective, and peristalsis produces the remainder of the destruction of the exposed muscular layer. Secondary carcinoma occurs in gastric ulcer in from 5 to 10 per cent of the cases. Ulcer formation leads to proliferation of the blood vessels; less frequently to exposure and irritation of the nerves with the production of pain.

In addition to this spontaneous or hyperacidity gastritis there is the exogenous toxic gastritis. Alcoholic abuses have dual effects. In exogenous gastritis not only the epithelial cells but also the glandular cells and the stroma are damaged from the start. It is very difficult to demonstrate this gastric impairment either anatomically or pathologically in man. The physiological inflammation, according to Roessle, with increased efficiency of the epithelial glands and musculature, increased circulation, and infiltration of leucocytes into the various layers of the gastric tissues followed every meal and was accompanied by hyperemia, edema, and increased mucus production which occurred after each trauma.

The author concludes that with regard to the gastric forms of stomach diseases, be they endogenous, due to a hyperactive gastric juice, or exogenous, due to dietary intoxication, we should not forget the gastropathies of purely nervous, hormonal, or avitaminotic types, especially not, if we desire a clear understanding of the final causes of the anatomical and functional change of the mucous membrane and its clinical function.

(EGGERT). SAMUEL J. FOGELSON, M.D.

Achmatowicz, L.: Observations on and Contributions to the Therapy of Acute Mechanical Intestinal Obstruction (Beobachtungen und Beiträge zur Therapie des akuten mechanischen Darmverschlusses). *Arch. f. klin. Chir.*, 1936, 187: 506

The author reports his experiences in operating on 461 cases of intestinal obstruction, among which

were 91 hernial incarcerations 12 intussusceptions and 158 other forms of intestinal obstruction. The report includes statistical tabulations concerning the distribution of the cases according to the age of the patient and the season of the year during which the operation was performed. It is noteworthy that during the six warm months from May to October almost twice as many patients were operated on as during the cold months from November to April. Only 10 per cent of the patients were operated on the first day of their illness 25 per cent on the second day and 65 per cent during the later stages of the disease. One hundred and thirty eight cases are tabulated according to the cause of the intestinal obstruction of this group 65 were cured and 63 (45.5 per cent) terminated fatally.

Recovery following acute mechanical intestinal obstruction depends in the greatest degree upon the timeliness of the diagnosis and the early performance of the operation. Early surgical intervention is possible only if the public has been made aware of the dangers of this disease and if there is close co-operation between the general practitioner and the surgeon. A person ill with intestinal obstruction is greatly endangered because of intoxication and has only slight powers of resistance. For this reason only the most simple and absolutely necessary operative procedure should be undertaken. None of the remedies which are available for the purpose of detoxifying the organism is absolutely dependable. According to the experience of the author blood transfusions are worthy of trial.

(L. DUSCHÉ) HARRY A. SALEMYAN M.D.

Milaret J. Diverticula of the Duodenum (Les diverticules du duodénum) *J. de chir.* 1937 49 366

In spite of the relative frequency of duodenal diverticula the clinical manifestations and treatment have by no means been well established. Very often certain symptoms have been attributed to the presence of a diverticulum when they could have been explained by some associated lesion. Various methods of treatment have been employed without precise indications and little is known of the late results of operative procedures.

Eighty five per cent of duodenal diverticula occur in the second portion of the duodenum nearly all arise from the concave surface and are more or less intimately connected with the pancreas. Occasionally they are multiple or associated with diverticula elsewhere in the intestinal tract. Most of them are the false type consisting of a hernia of the intestinal mucosa along the blood vessels. They seldom occur in a patient less than fifty years old.

On the basis of the symptomatology six types can be recognized:

1. The dyspeptic type. The patient complains of discomfort and pressure in the epigastric region which occurs a variable time after eating and lasts for a variable period. These symptoms occur in the absence of inflammatory changes and are due to simple distension of the diverticulum.

2. The pseudo ulcerous type. This is the most common type and is due to diverticulitis.

3. The pyloric stenosis type. This symptom results from compression of the duodenum by the distended diverticulum.

4. The intestinal type. Vague symptom of enteritis are noted.

5. The gall bladder type. In this type there are crises of pain in the right hypochondrium which closely simulate gall stone colic. Also there may be icterus.

6. The pancreatic type. Intense periumbilical pain which occurs without relation to meals vomiting diarrhea loss of weight and sometimes icterus are noted. If the latter condition is present the symptoms may simulate those of a pancreatic tumor.

The complications to which diverticula are occasionally subject include acute inflammation perforation gangrene and rarely cancer.

Diverticula are seldom responsible for digestive symptoms. Demole in 1936 stated that in forty six cases of diverticula observed roentgenologically some other associated lesion was responsible for the symptoms. Considering only the cases confirmed at operation hardly a dozen could be found in which the diverticulum appeared to be the essential trouble. The case histories of four such cases are given briefly. In three patients there had been prolonged postprandial distress with vomiting the fourth suffered from profuse gastric hemorrhages. In each case removal of the diverticulum was followed by permanent relief. Similarly case histories are cited in which diverticula were the cause of biliary and pancreatic symptoms.

Operative treatment has given an immediate mortality of about 16 per cent. This includes cases in which other lesions such as cholelithiasis were treated at the same time. As far as diverticula alone are concerned the intrapancreatic diverticula offer the greatest operative difficulties and dangers.

Because operative treatment carries real risks and a diverticulum is seldom a menace to the life of a patient it may be asked to what extent an operation is justified by its late results. In twenty two unpublished cases collected by the author the results were as follows: an error in diagnosis was made in two cases postoperative death occurred in four death from gastric carcinoma occurred ten months later in one no improvement in the symptoms was found in four amelioration of symptoms occurred in one and complete cure was obtained in three.

Indication for operation can be considered only after a complete study of the patient. This study should not merely establish the existence of the diverticulum but should make certain that no other lesions are present. If the diverticulum is the only lesion that can be detected operation may be done because of progressive loss of weight rebellious gastro-intestinal symptoms or icterus. Even under these circumstances the intervention will be in the nature of an exploratory operation with the diverticulum as a secondary consideration.

Among the operations that have been employed, resection of the diverticulum is the best. Invagination is equally dangerous but possesses several disadvantages. When icterus due to the diverticulum and changes in the pancreas is present, drainage of the biliary tract should follow the resection.

ALBERT F. DE GROAT, M.D.

Shanks, S. C.: Congenital Abnormalities of the Colon. *Brit J Radiol*, 1937, 10: 261

The appendix, being a vestigial structure, is subject to many anatomical variations in length, lumen, position, and mobility. In the barium meal the appendix appears classically as a blind tube 3 to 4 in. in length with a single or double curve. Many variations from this prototype exist. Diverticula of the appendix are rare but the writer has seen one case. Misplacements of the appendix depend on misplacements of the cecum, either as the result of arrested rotation of the colon or on account of an unduly long mesocolon.

The large intestine comprises the cecum, colon, and rectum. The cecum next to the rectum is the widest and most distensible portion. Situated in the right iliac fossa, its normal shift in the prone and erect positions is one and one-half inches. In 5 per cent of the cases the cecum has no mesentery and is fixed in position. The ascending colon is bare to the peritoneum posteriorly but in spite of this, it displays a surprising degree of mobility. In normal subjects, the hepatic flexure of the colon lies in contact with the under surface of the liver. The transverse colon is subject to great variation in position because of its mesentery. The descending and iliac portions drop straight down to the pelvic portion. Anatomical variations may be classified as anomalies of length, rotation, fixation, and size. The anomaly of complete transposition associated with transposition of all abdominal contents is of chief importance when an appendectomy is contemplated. Congenital dilatation of the colon, megacolon, or Hirschsprung's disease, is characterized by a varying degree of dilatation and hypertrophy of the colon without any apparent causal organic obstruction, and obstinate constipation dating from birth. The more severe cases occur in the young. The dilatation may involve the entire or only a part of the colon. The rectum is not involved and the cecum usually escapes the dilatation. The bowel wall may exhibit muscular hypertrophy and even fibrous hyperplasia. The pathogenesis of this condition remained obscure until Hurst pointed out the similarity to esophagectasia in cardiospasm and included it in the list of disorders resulting from derangement of the sympathetic neuromuscular system. Successful and even dramatic results have followed abdominal sympathectomy in these cases.

Because of the gaseous distension of the colon usually present, a simple roentgenogram often demonstrates the dilated coils clearly, but does not show enough detail to differentiate a moderate degree of Hirschsprung's disease from obstructive

colonic dilatation. A barium meal should never be used in the investigation of these cases because of the difficulty in getting rid of the inspissated barium. The barium enema is the method of choice. In a marked case the appearances are typical. The enema fills the rectum out to its normal size, and when the sigmoid is outlined the latter is seen to have approximately an equal or greater caliber than the rectum. Haustra are either absent or very slight. The sigmoid loop may be very long or in the shape of an acute "U" with the bend in the upper abdomen. It is rare for the barium to reach further than the splenic flexure in the advanced cases. Two operations are in vogue at the present time: (1) removal of the second, third, and fourth lumbar sympathetic ganglia on both sides with the connecting rami, and (2) periarterial sympathectomy, by stripping off the plexus surrounding the first inch of the inferior mesenteric artery. Satisfactory results have been obtained with both operations and failures as well.

JOHN W. NEZGER, M.D.

Margottini, M.: Chronic Appendicitis (*L'appendicite cronica*). *Policlin*, Rome, 1937, 44: sez. chir. 76

There is a great deal of objection to designating chronic appendicitis as an idiopathic illness. Some consider it the result of a preceding acute inflammation, some admit its existence only when it accompanies disease changes in neighboring organs. Others wish to restrict the term to tuberculosis and actinomycosis of the appendix.

Guided by clinical as well as by histological criteria, the author reports that among 487 operations for appendicitis in the San Giovanni Hospital in Rome there were 33 cases (6.8 per cent) which were rightfully diagnosed as chronic appendicitis. The symptoms were similar to those of the acute type but less severe, or they consisted of dyspeptic disorders, sometimes even simulating cholecystitis, chronic gastritis, or gastric ulcers. In some cases pelvic symptoms, such as frequent urination or dysmenorrhea, prevailed. Some cases showed absolute latency and the diseased appendix was revealed at operation for other reasons. Histologically, the picture of chronic appendicitis was twofold: hyperplasia of the lymph follicles, often with numerous eosinophile cells in the mucosa, or atrophy of the mucous membrane with obliteration of the appendix by fibrosis. That the appendix really was the cause of the illness in these cases was demonstrated by the fact that 90 per cent of the patients were free from symptoms after the operation. Therefore, appendectomy should be advised, when medical treatment does not give relief, especially as there is always the possibility of an acute flare-up of the chronic process. The incision should be large enough to allow a thorough exploration of the abdomen. Very often similar lesions affecting the last part of the ileum, the cecum, or the adnexa of the uterus may be discovered.

HELENE LUBOWSKI, M.D.

Caminiti R. The Appendicular Syndrome with out an Appendix (Sindrome appendicolare senza appendice) *Polislin*, Rome 1937 44 sez chir 70

Up to the eighth week of fetal life there is only one cecal sac. Thereafter the upper part enlarges to form the cecum, while the lower part shows only a limited growth and forms the appendix. In some cases the latter development may be arrested and the child born without an appendix. The author came across one such case among 243 operations for appendicitis. The most exact and prolonged searching on the operating table did not reveal any trace of an appendix. The cecum was found to have a perfectly normal shape and only the adhesions around it accounted for the clinical picture which had led to the diagnosis of appendicitis. The patient was benefited by the solution of the adhesions.

Medical literature old and new contains accounts of about 50 such cases which were found either on the operating table or at autopsy. The author discusses the possibility of destruction of the appendix by pathological processes or by senile involution. Even after making an allowance for such destruction there always remain cases of complete agenesis of the appendix and cases in which there is at least a small button as a hypoplastic substitute. However these anomalies are so exceedingly rare that the knowledge of their existence should never detain a surgeon from undertaking an intervention if it seems to be indicated.

HELENE LUBOWSKI M.D.

LIVER, GALL BLADDER PANCREAS AND SPLEEN

Dunnath W. White Bile (Ueber die weisse Galle) *Beitr z path Anat u s. allg Path* 1936, 98 145

Two cases are described in which white bile was found in the entire biliary system and at the same time a marked cholesterin deposit in the wall of the gallbladder and bile ducts. The unanswered question as to how hydrops of the bile tract occurs was again raised. Attention was called to the little known but basically important work of Rous and MacMaster. These investigators made studies in the dog in which animal the hepatic ducts are separate for a long course and the gall bladder empties into the right hepatic duct. By ligating the branches of the hepatic ducts and examining the bile it was definitely found that the gall bladder concentrated the contained bile tenfold. Ligation of the hepatic branch below the opening of the cystic duct led to the formation of green bile. Ligation of the left hepatic duct, so white bile. The latter was also formed if a portion of the hepatic duct was isolated and both ends were tied. From these observations it was concluded that by the exclusion of the gall bladder the capacity for pressure regulation in the duct system was lost. After a certain period the secretion of bile in the liver was rendered impossible thereby while the mucous glands continued to secrete and fill the bile ducts with a serous colorless fluid. The contents of the

bile tract lost their color as the bile was absorbed by the lymph and blood. The contents of the biliary system took on the colorless character of the bile duct gland secretion. According to this, the procedure was not necessarily based on the presence of inflammation. In numerous examples of white bile it was shown that when the gall bladder was mechanically or functionally excluded by the loss of its mucous membrane it lost its pressure regulating action. Acute, recent inflammation has not been described in any of the cases of white bile reported in the literature. The association of recent inflammation is not necessary for the formation of white bile. However it may favor the process. This assumption confirms rather than contradicts the experiments of Bernhard. In contrast to this hydrops of the gall bladder is only produced by inflammation. In the two cases from the Aschoff Institute cholesterin ester was demonstrated in the gall bladder wall. It had no special significance and came from the blood serum which reached the biliary system during the inflammatory process.

(F. BERNHARD) LEO M. ZIMMERMAN M.D.

Tantini E. Obstruction of the Common Duct from Tuberculous Adenopathy of the Hilus of the Liver (Ostruzione del coledoco da adenopatia tuberculare dell'ilo epatico) *Riv di chir* 1937 3 73

A woman of forty with no history of any importance and apparently in good health was suddenly stricken in October 1927 with intense pain in the right hypochondrium which radiated in the back and epigastrium. The next morning she presented icterus; the urine was dark colored and the stools were white. The pain gradually decreased and in two weeks she was normal.

In March, 1928 she had a similar attack. In December 1929 she again had very violent pain in the right hypochondrium which radiated to the right shoulder and epigastric region. At the same time she vomited a greenish mixture and had fever ranging from 37.5 to 37.9 degrees. The next day she was icteric and the urine was dark and the stools greenish. The pain gradually decreased but the icterus and abnormal color of the stools and urine persisted. She was sent to the hospital on December 15.

She presented an intense icterus of the skin and mucous membranes and a slight bilateral enlargement of the cervical and inguinal glands. The cardiovascular system was normal. In the upper right quadrant of the abdomen there was a mass the size of a mandarin which moved slightly on deep inspiration. Pressure caused such intense pain that it was impossible to determine the exact form or character of the surface of this mass. On its median side at the level of the umbilicus was a hard nodule the size of a large filbert. The liver was enlarged considerably; the spleen only moderately.

A roentgenogram of the liver region after the injection of tetraiodophenolphthalein showed a pear

shaped shadow of the gall-bladder. A diagnosis of calculous cystitis and calculus of the common duct was made and operation performed. There were tenacious adhesions of the gall bladder to the omentum, so that the gall bladder seemed to be wrapped in a sheath of adhesions. There were no stones in the gall bladder nor in the common or cystic ducts. There was an enlarged gland of the size of a walnut at the bifurcation of the common and cystic ducts. It was easily enucleated and removed. Uneventful recovery followed.

Histological examination revealed caseous tuberculosis of the gland with secondary periadenitis of the sclerotic type. AUDREY GOSS MORGAN, M D

Guidi, G.: Experimental Studies on the Contractility of the Gall Bladder (*Studio sperimentale sulla contrattilità della cistifellea*) *Arch ital d mal dell' appar digerente*, 1936, 5 553

After a condensed résumé of some of the literature concerning the physiology of the gall bladder, the author presents a description and the results of his personal researches. His early work was done with the gall bladder of the pig. Although he followed the technique described by others, he was not able to obtain contractions which could be recorded. He was equally disappointed with his observations of the gall bladder of the large rat.

He then tried the gall bladder of the guinea pig and devised his own method of procedure. He utilized the cystic or common duct for the establishment and measurement of pressure within the gall bladder. The fundus was simply suspended with a small hook as is common in studying the heart of the frog. This small hook was connected to the recording lever. The entire preparation was kept in a constant temperature bath of normal Ringer's solution saturated with oxygen. He did not measure the pH regularly, but found that the gall bladder would contract at any pH from 7.8 to 7. The bile was allowed to remain within the gall bladder.

As is indicated in an accompanying graph in the article, fairly rhythmic equal contractions were mani-

festated at regular intervals of an average of about one and one-half minutes, and varying from one to two minutes. The optimum endocystic pressure for the function of the isolated gall bladder was not equal in all preparations, but approximated 20 cm of water in a tube 1 cm in diameter. The influence of other factors and drugs on these contractions is now being studied.

A. LOUIS ROSE, M D

Simon, E.: Tumors of the Gall Bladder (*Tumoren der Gallenblase*) *Chirurg*, 1936, 8 966

Benign tumors rarely occur in the gall bladder. They may be myomas, fibromas, and adenomas. Occasionally cystadenomas which develop from the ducts of Luschka are seen. Cysts may also be produced by the echinococcus, as shown in one case. Tumors of the gall bladder are almost always malignant, usually carcinoma. Carcinoma limited to the gall bladder is seldom observed, and when it is, metastases usually appear shortly after surgical treatment. Roentgenological visualization of the gall bladder does not permit the early recognition of carcinoma, usually the gall-bladder carcinoma has already extended to adjacent structures. Often, however, the apparent carcinomas are inflammatory processes. Gall-bladder carcinoma may develop after cholecystostomy. An interesting case is described in which one and one-half years after the removal of pus and stones with subsequent drainage an inoperable carcinoma was found. The association of gall stones and carcinoma of the gall bladder was demonstrated in from 70 to 80 per cent of the cases. It is believed that gall-bladder carcinoma arises as any other carcinoma, but that its development is favored by the presence of stones. Carcinoma is particularly likely to develop in a chronically inflamed, stone-containing gall bladder. About 5 per cent of all patients with gall stones develop carcinoma later. This leads to the conclusion that early operation should be performed for gall stones, particularly when the stones occur in patients of cancer age.

(F BERNHARD) LEO M ZIMMERMAN, M D

GYNECOLOGY

UTERUS

Keller R. and Burger P. Adenoma of the Body of the Uterus in Older Women (*L'adénome corporeux polypeux de la matrone*) *Gynécologie* 1937 36 5

The authors note that this type of uterine tumor is discussed but little in the literature and is undoubtedly of relatively rare occurrence. It may be also that it is not recognized in all cases in which it occurs. It is found in older women after the menopause and usually several years after menstruation has ceased; therefore it arises in a senile mucosa.

This type of tumor shows distinguishing characteristics. Contrary to the usual type of mucosal polyp it develops from hyperplasia of the mucosa with more or less marked glandular formation and as it grows in size forms a pedicle mechanically by reason of its weight and the effect of the expulsive forces of the uterus. The pedicle is large and may be found in any position at the lower as well as the upper pole of the tumor or at the side. From this pedicle the tumor grows in all directions and enlarges the uterine cavity. This type of polypoid adenoma is absolutely benign, shows no tendency to recur after its removal and no metastases. The only clinical symptom is bleeding, sometimes continuous, sometimes intermittent, which alternates with a discharge of glairy mucous, but the amount of blood lost is never large. The bleeding and the enlargement of the uterus naturally suggest a cancer of the body of the uterus. Curettage is always indicated. In cases of this type the cervix is easily dilatable, the uterine cavity appears large and elongated, the tumor presents a soft almost rubbery resistance to the curette and it is very difficult to obtain sufficient tissue for examination unless the instrument catches on some irregularity in the tumor. Sometimes the tumor can be grasped with a dressing forceps and removed *in toto* or piecemeal by rotation and traction. The authors complete the treatment by the application of a small amount of radium about 9.6 mcd.

The size of these tumors varies. According to the authors' observations in three cases which they report the tumors varied in length from 4 or 5 to 10 cm. or more and in thickness from 2 to 3 cm. The surface was irregular owing to the multiple cysts in the tumor. The color was dark red or sometimes grayish red. On palpation the tumor showed a certain resistance comparable to that of rubber. It was not friable like a mucous polyp nor hard as a submucous pedunculated fibroma.

Histologically this type of tumor shows a rather dense stroma and the vascularization varies. Sometimes the capillaries are dilated and numerous, elsewhere they are of moderate caliber with thickened wall, and sometimes the blood vessels are almost

entirely absent. The peculiar aspect of the tumor is caused by its glandular formation. The mucosa that lines the rest of the uterine cavity shows complete senile atrophy, but in the tumor the glands show marked activity and growth. There are two chief types of gland formation: groups of glands close together and glands at a greater distance from each other with considerable stroma separating them. The shape of the glands is very irregular. There are no histological signs of malignancy. All the glands show a tendency to form microcysts, which are very numerous and give the tumor its typical puggy appearance.

LUCE M. MEXIAS

Wohlfill F. On the Stroma of Cervical Carcinoma (*Sobre o estroma do carcinoma do colo do útero*) *Arq. de patol.* 1936 8 64

The author reports his investigation of the stroma in 100 cases of carcinoma of the cervix and portio. Great variety in the cellular infiltration as well as development of the reticulum were observed. Both of the preceding proved to be intimately associated with each other. Where an accumulation of reticulocytes is marked, three dimensional nets of reticular tissue are formed in the meshes of which the various kinds of inflammatory elements are found. The latter sometimes present a mixture of the various infiltrating cells, even to the point of uniting themselves into a typical granulation tissue or they may be present in more or less pure formations of separate and distinct types of cells. When lymphocytes are the only infiltrating cells, the picture of typical lymphatic tissue may arise. In one case the histological picture was so overwhelmingly that of lymphatic tissue and the potentialities for growth as manifested by mitoses in the lymphocytes were so great that the picture could easily be mistaken for that of a carcinoma and a lymphosarcoma forming together a mixed tumor. These facts suggest that the marked growth of collagenous connective tissue in cirrhus carcinoma and the bone formation in osteoblastic carcinoma are all reactions of a similar type. A relation to the occurrence of healing could not be established.

In thirteen cases eosinophilic leucocytes were noted as the predominant element and a relationship with the presence of necrosis could not be established. In contrast to the observations of others the author found that many such cases exhibited a not inconsiderable blood eosinophilia which reached 17 per cent of all the white cells, while in the control cases this percentage remained within normal limits, never exceeding 5 per cent. Because of the small number of cases the author draws no conclusions from this relationship.

The stromal reaction causes the formation of a basal membrane at the peripheries of the tumor masses. Sometimes this membrane is arranged as a

more or less complete network around the concentric tumor cores. Within the basal membrane the tumor nests are sometimes entirely free of reticulum. Frequently, however, more or less numerous fibers branching off from the basal membrane, especially in the peripheral zones of the tumor masses, are found.

The significant features in the formation of the stroma are set forth. Legitimate relationships between specific carcinoma forms and specific stromal reactions could not be established. This held true for the specific formation of lymphatic tissue also. The author believes that definite specific influences on the tumor parenchyma exist, but they cannot be expressed in terms of morphological structure alone.

Wohlwill admits that his original belief that different kinds of stromal reactions reflected differences in the prognosis is no longer possible in the light of his later work.

DANIEL G. MORTON, M.D.

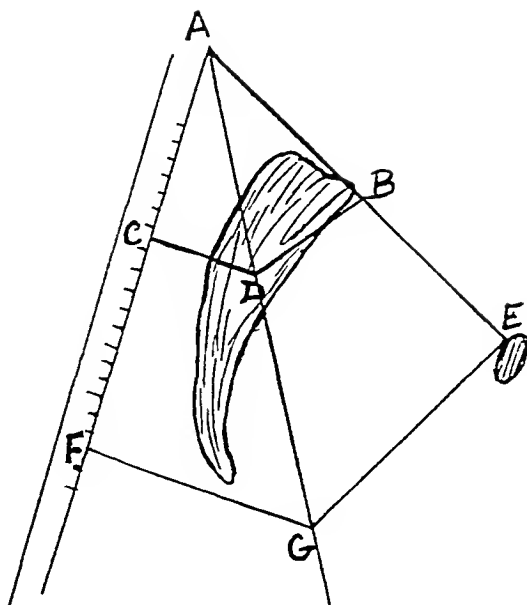
MISCELLANEOUS

Madsen, V.: Roentgenological Measurement of the True Conjugate Diameter (Roentgenologische Messung von Diameter conjugata vera). *Acta obst et gynec Scand*, 1937, 17, 53.

Frontal roentgenological exposures have been made for a long time to obtain information regarding the position of the fetal head in the pelvis, especially when suspected of being abnormal, and also in cases in which there is doubt as to the fetal part presenting. Such exposures give no definite information as to the amount of the pelvic contraction, or whether the head has descended or not. However, overlapping of the cranial bones has indicated the descent of the head. The size of the true conjugate diameter of the pelvis and the descent of the head are two important factors during the process of labor when it is prolonged, and also when pelvic measurements indicate pelvic contraction, especially in suspected rachitic cases. The exploratory measurement of the diagonal conjugate is not always possible or even desirable when labor has begun. The head may obstruct the exploring finger, exploration during labor is best avoided, especially when cesarean section may be necessary, and besides, the diagonal conjugate gives no definite information as to the size of the true conjugate. For these reasons the roentgenological measurement of the true conjugate diameter in the lateral position is proposed.

The patient is placed in an accurate lateral position with slight flexion of the hips and knees. By means of adhesive plaster a metal scale measured in centimeters is attached to her back over the spinous process of the lumbar spinal column and sacrum in such a position that it lies in the intergluteal fold. The x-rays are centered toward the most posterior edge of the acetabulum. The measurement is carried out as follows:

A line is drawn from the uppermost internal angle of the symphysis to the promontory and lengthened until it cuts the measure. The angle A thus produced



is bisected, and a perpendicular is then erected from the promontory to the bisecting line. From the point of intersection, D, a line is drawn at right angles to the measure at point C. Starting at the uppermost and most posterior angle of the symphysis a line is drawn parallel with the line BD, which cuts the bisecting line at G, and from this point a line, FG, is drawn parallel with the line CD, which also forms a right angle with the measure. The resulting triangles, ABD and ACD, are equal, as are also angles, AEG and AFG. The distance AB equals AC and the distance AE equals AF. Therefore, the distance BE, the true conjugate, equals that of CF, which is read on the measure. With this technique the direct measurement was found to be identical with the roentgenological measurement both in normal and abnormal pelvis. Roentgen exposures during labor have not injured the fetus.

This technique was tried out on anatomical specimens, at necropsies, and in a series of patients in labor, and the results were found to be reliable.

LOUIS NEUWELT, M.D.

Porchownik, J. B., and Wittenburg, W. W.: Roentgen Treatment of Menstrual Disturbances in Young Women. Results of Twelve Years' Experience (Roentgenbehandlung der Menstruationsstörungen bei jungen Frauen. Ergebnisse unserer 12 jährigen Erfahrungen). *Roentgenprax*, 1936, 8, 695.

In the period from 1924 to 1935 the authors have treated 225 women with various functional menstrual disturbances by weak irradiation of the ovaries and hypophysis. In one sitting from 10 to 12 per cent of a skin erythema dose was used on

the ovary and from 25 to 30 per cent on the hypophysis from several fields with a 5 ma 160 kv 0.5 mm copper plus 1 mm aluminum filtration. One hundred and forty of the patients could be followed up. Of these twelve were between sixteen and twenty years of age, thirty nine between twenty one and twenty five, fifty three between twenty six and thirty and thirty six between thirty one and thirty nine years. The treatment was successful in 43 per cent of the cases, there was improvement in 20 per cent and in 37 per cent there was no success. The results were more favorable in the younger patients than in the older. According to the resulting data there was improvement not only in the quantitative disturbances, the hypoamenorrhea and hyperamenorrhea and the qualitative disturbances, the spanmenorrhea and amenorrhea, but there was also a favorable influence on the general tonus of the body. The authors believe that the irradiation stimulates the vegetative nervous system so that there is a resulting hyperemia with improvement in ovarian function. In from 15 to 18 per cent of the cases conception occurred after treatment. The women had had from three to eight years primary or from three to nine years secondary sterility. In two thirds of the cases pregnancy terminated without complications, in the others there was a miscarriage. This was not believed to be due to roentgen injury of the ovum but rather to the frequently simultaneous existence of malposition of the uterus. The full term fetuses were normally developed. Even after temporary roentgen castration the authors could determine no injury of the child as long as the fertilization had occurred after the reestablishment of the menstrual cycle. The authors caution against x ray irradiation, especially repeated irradiation in the same person as was done in these cases. Even when there is no demonstrable injury to the newborn there is still danger of injury to the germ cells and if two such damaged germ cells meet there is not only the danger to the individual but also to the race.

(W. GENICK) JACOB E. KLEIN, M.D.

Westman A. and Jacobsohn D. The Effect of Estrin on the Corpus Luteum Function. (Ueber Oestrinwirkungen auf die Corpus luteum Funktion). *Acta obst et gynec Scand* 1937 17:1.

As a continuation of previous experiments in which it was shown that the development of corpus

luteum is to a high degree affected by estrin, the author tested the possibility of prolonging the time of function of the corpus luteum in pseudogavid rabbits by the administration of follicular hormone.

Twenty four tests were made. These showed that the corpus luteum still presented a histologically normal structure on the thirty first day after copulation and only on the thirty fifth or thirty sixth day signs of beginning degeneration appeared. In the majority of the cases the daily dose of estrin given intramuscularly, varied between 0 and 50 mouse units.

On account of the treatment with estrin the uterine mucosa in most cases presented an estrin reaction. In some cases, including one which was examined on the twenty fifth day, the effect of the estrin was not strong enough to inhibit the action of the hormone from the remaining corpora lutea with the result that a typical corpus luteum reaction in the endometrium was present. From this it appears that the remaining corpora lutea produce specific hormones.

Westman A. and Jacobsohn D. The Effect of Estrin on the Corpus Luteum Function. Part 2. (Ueber Oestrinwirkungen auf die Corpus luteum Funktion II). *Acta obst et gynec Scand* 1937 17:13.

In a previous work it was shown that the time of function of the corpus luteum can be considerably prolonged by treatment with estrin.

In order to find out whether the estrin acts directly on the ovary or through the hypophysis a series of experiments were carried out in which hypophysectomized pseudogavid animals were treated with estrin.

These experiments showed that the corpus luteum which under normal conditions degenerates on the third or fourth day following hypophysectomy may remain intact as long as the thirteenth day following the hypophysectomy as a result of the estrin treatment. As seen from the reaction in the uterine mucosa the corpora lutea show a wholly satisfactory production of specific hormone.

If the hypophysectomy is carried out before the quantity of gonadotropic hormone necessary for follicle rupture and corpus luteum formation has had time to secrete, no corpora lutea are formed even though the test animals are treated with great quantities of folliculin.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Mackenzie, L. L. : A Statistical Study of the Treatment of Placenta Previa. *Am J Obst & Gynec*, 1937, 33: 577

A series of 22,115 cases of placenta previa has been studied. This series, the largest noted in the literature, has been taken both from the published reports of the world and from a smaller number of hitherto unreported cases.

The treatment and the result of treatment, in terms of maternal and fetal mortality, have been considered. Delivery has been divided into two groups: one comprising those women delivered by cesarean section, the other those delivered by any other means. Various other factors, such as the parity and the degree of placenta previa, have been studied. Maternal and fetal mortality has also been classified according to the degree of placenta previa and the method of delivery.

A few rather interesting facts are brought out. There was almost no maternal mortality in the case of partial or marginal varieties of placenta previa when the patients were delivered by cesarean section. The maternal mortality from lateral placenta previa delivered from below was higher than that of central placenta previa delivered by abdominal section. The fetal mortality in partial placenta previa was much higher than that of the marginal type. Both types were treated by cesarean section. In each degree of placenta previa, cesarean section gave a lower mortality rate than resulted from delivery from below.

Statistics are presented covering the facts reported from the principal countries of the world. The methods of delivery and the results of treatment in terms of maternal mortality are shown, and various contrasts between these factors are drawn. In the United States there has been a greater tendency toward cesarean section for placenta previa, while in Central Europe treatment has remained approximately the same.

In general, it may be stated that the risk for the mother and child in cases of placenta previa is less when delivery is terminated by cesarean section than it is following delivery from below.

EDWARD L. CORNELL, M.D.

McIlroy, A. L., and Rodway, H. E. : Weight Changes During and After Pregnancy, with Special Reference to the Early Diagnosis of Toxemia. *J Obst & Gynaec Brit Emp*, 1937, 44: 221

One thousand patients, 704 primigravidas and 296 multiparas, were kept under observation from the twenty-fourth week of pregnancy to term. The average periodic gain in weight was 11 lb 2 oz in the primigravidas and 11 lb 7 oz in the multiparas. The maximal increase, 3 lb 5½ oz, occurred

from the twenty-fourth to the twenty-eighth week. The minimal, 2 lb 4 oz, increase occurred from the twenty-eighth to the fortieth week. All the patients showed a lower increase in weight than that found by other observers. This was probably due to the advice given to every patient as to dieting and exercise in order to prevent the onset of toxemia.

The age of the patient had an influence upon the gain in weight in pregnancy. The older the patient the less increase there was in weight. The least gain occurred in patients of thirty-six years of age and upward, it was two-thirds less as compared to that of patients of thirty years or under. Parity has little or no influence. There was a slight average total gain, 11 lb. 7 oz., in the multiparas as compared to that of the primigravidas, 11 lb. 3 oz. Heavy patients showed less gain in weight than those of lighter build.

The weight of the infant seems to have little influence upon the changes in the maternal weight. The infants of primigravidas were heavier if the maternal weight showed much increase. In this series there was very little difference in the gain in weight of the patients who gave birth to infants of 10 lb. or more and those of 5 lb. or less. Nine patients whose weight at term was less than that at the twenty-fourth week gave birth to infants weighing from 6 lb. to 9 lb. 7 oz. There was a gradual increase in weight of the infants of multiparas who were over thirty years of age. Male infants were found to be slightly heavier than female.

A decrease in weight occurred during the last two weeks before delivery in a number of cases, 22.5 per cent of the primigravidas and 22.15 per cent of the multiparas. A few patients showed a periodic loss of weight throughout pregnancy. This is difficult to explain and may be due to loss of tissue from excessive fetal demands; although these patients did not show any marked evidence of malnutrition. Loss of weight is, as a rule, due to an increase in exercise, reduction of the carbohydrate intake, and increased elimination.

In the 75 cases of toxemia the average age was thirty-three years. All of the patients had albuminuria, systolic blood pressure of 140 mm Hg, and edema of varying degrees. The average periodic gain and the total increase in weight were greater in this group of cases. From the twenty-fourth to the thirty-eighth week the gain in weight was 50 per cent greater than that of the normal cases. During the last two weeks of pregnancy it was almost three times as much as that of the series of normal cases. The total gain was one and a half times that of the non-toxic cases.

Excessive or rapid gain in weight was due to errors in diet and lack of regular exercise in the majority of the cases. The reduction of weight was very definite when the carbohydrate intake was

lessened and more walking was done. Excessive gain may also be due to edema of the tissues although it is not evident on clinical examination until later. Some toxic patients had marked edema without excessive gain in weight.

Patients with marked hyperemesis, malnutrition, disease conditions or death of the fetus were excluded from the series under observation.

The prevention of toxemia and the early recognition of signs of its onset were obtained by careful attention to the routine weighing of antenatal patients.

Seven hundred and ten patients were weighed approximately six weeks after delivery and it was found that primigravidae showed an average loss in weight of 21 lb 5 oz and multiparas 18 lb 14 oz. The birth weight of the infant accounted for one third of the decrease in the primigravidae and two fifths in the multiparas.

J THORNWELL WITHERSPOON M.D.

Stroganoff W and Davidovitch O. Two Hundred Cases of Eclampsia Treated with Magnesium Sulphate. A Preliminary Report. *J Obst & Gynec Brit Emp* 1937 44 289.

The authors describe the treatment of eclampsia as follows:

The patient is placed in a quiet, somewhat darkened room under the constant observation of a trained nurse. Measures are taken to avoid any disturbance or irritation of the patient in order that he may fall asleep. Following a convulsion or on the patient's admittance to the hospital, she is given an injection of from 0.015 to 0.02 gm of morphine muscularly under light chloroform anesthesia and is examined. In eclampsia chloroform is administered but for short periods of time and in low concentration; it is mixed with large quantities of air. Chloroform has been used in over 1,500 cases of eclampsia without any harmful effect. In thirty minutes about 6.0 gm magnesium sulphate is given subcutaneously, preferably 4.0 gm of a 15 per cent solution. One and one-half hours later morphine 1 injected and three and one-half hours later 6.0 gm of magnesium sulphate is given again if there has been another convulsion. About 4.0 gm of magnesium sulphate is given if there has been no convulsion and symptoms of its approach are absent. If delivery does not occur from 4.0 to 3.0 gm of magnesium sulphate is administered after an interval of six and then again after eight hours. If the convulsions do not cease the patient is given the full dose i.e. 6.0 gm magnesium sulphate but no more than 24.0 gm in twenty-four hours. Venesection or venepuncture is performed and the membranes are ruptured in each of the cases in which the patient is admitted to the hospital after having had two or three severe convulsions or six or more less severe convulsions. It is of the greatest importance that the patient be kept warm and lying preferably on her right side as well as to administer oxygen following a convulsion. The room should be properly

ventilated and the patient should breathe as regularly as possible.

The number of cases treated in two hospitals was 207. Eclampsia developed during pregnancy in 4 (20.9 per cent), during labor in 110 (53.1 per cent) following delivery in 49 (23.4 per cent). Seventy-two (35.8 per cent) were emergency cases and the other 129 patients were booked cases. One hundred and seventy-nine (86.1 per cent) were primiparas, 163 (78.7 per cent) primigravidae and 11 (6.0 per cent) were multiparas. Ten patients had a multiple pregnancy, the rest a single pregnancy.

Of the 207 patients 6 died.

The postpartum period was normal in 126 cases (61.7 per cent). Morbid conditions developed in 75 (37.3 per cent) as follows: endometritis in 24, puerperal ulcers in 4, perimetritis in 1, pyosalpingitis in 1, metastatic bacteremia abscess following the administration of magnesium sulphate in 2, suppuration of the wound following cesarean section in 2, separation of the sutures of the perineum in 1, pyelitis in 7, cardiac decompensation in 1, meningencephalitis in 0, shock in 2, fever without definite localization in 7, cystitis in 7, paracystitis in 1, mastitis in 3, subinvolution uteri in 7, psychosis in 1, sinusitis in 2, bronchitis in 2, dry pleurisy in 1, pneumonia in 2, hemorrhagic colitis in 1, nephritis in 1 and rupture of the uterus in 1.

Two hundred and twelve children were born, 167 (78.8 per cent) left the hospital. Thirty were still born, and 15 died following delivery, a total of 45 (18.2 per cent). Of the latter number 20 weighed under 1½ lb which reduces the mortality among children to 11.8 per cent.

Convulsions were interrupted following the first administration of magnesium sulphate in 136 (67.1 per cent) of the patients and continued in 63 (32.3 per cent). The total number of convulsions which developed following the administration of magnesium sulphate was 204, an average of one convulsion to a patient.

The average stay at the hospital was 13.7 days. Sixty-nine (34.3 per cent) of the patients had delivery without surgical interference and 132 (65.7 per cent) were subjected to the following operations: cesarean section 2, one because of a narrow pelvis, the other because of atresia of the vagina; forceps 54, early rupture of the membranes 73, blood letting mostly by venepuncture 56, bringing down the foot 4, as instance by hand in breech presentation, podalic version and assistance by hand 4, extraction by the buttocks 1, version by Braxton Hicks method 1, metrurosis 5, perforation for a dead fetus 1, perineotomy 16, separation of the placenta by hand 8 and suturing of the ruptures of the perineum 51.

Cesarean section was scarcely ever used as a means of fighting eclampsia. More than 1,000 cases of eclampsia have been treated without resort to it.

The data prove that eclampsia has been conquered by means of magnesium sulphate and this

proper treatment can reduce the mortality rate below 0.5 per cent in initial cases and to from 2.5 to 4 per cent in advanced and infected cases

CHARLES BARON, M D

LABOR AND ITS COMPLICATIONS

Lankowitz, A. W.: Labor in 4,549 Patients with Contracted Pelvis (4,549 Geburten bei anatomisch engem Becken) *Ztschr. f. Geburtsh u Gynaek*, 1936, 113 372

In 30,275 births there were 4,549 cases with an external conjugate of 18 cm or less. The pelvis was generally contracted in 60.3 per cent, flat in 38.6 per cent, generally contracted and flat in 1 per cent, and asymmetrical in 1 per cent. The external conjugate was 18 cm in 74 per cent, 17.5 cm in 14.4 per cent, 17 cm in 9.8 per cent, 16.5 cm in 1.3 per cent, 16 cm in 0.5 per cent, and 15.5 cm in 0.05 per cent. Oblique and transverse presentations were seen in 0.4 per cent of the cases, breech presentation was seen in 3 per cent, and face or forehead presentation in 0.3 per cent.

A comparatively small number of the patients, 3.5 per cent, were treated operatively. The maternal morbidity of the operated cases was 27.5 per cent and of the cases with spontaneous birth, 5.8 per cent, and the mortality was 3.1 per cent and 0.07 per cent, respectively. The number of operated cases depended upon the pelvic diameter. Operation was required in 2.5 per cent of the cases with a conjugate measuring 18 cm, in 6.3 per cent of those measuring 17 cm, 24 per cent of those measuring 16 cm, and 100 per cent of those measuring 15 cm. The flat pelvis required operative delivery in twice as many cases as the generally contracted type. Cesarean section was performed in thirty-two cases or 0.7 per cent of all cases with a contracted pelvis. A like number of forceps deliveries were made. In eleven cases the fetal head had not yet entered the pelvis. In these, the maternal mortality was 18 per cent and the fetal mortality 73 per cent. In twenty-two cases in which the head had entered the pelvis so that less traction was needed, the maternal mortality fell to 5 per cent and the infant mortality to 45 per cent.

When the high forceps was used in the presence of a movable head the mortality was the same as that from perforation. Perforation occurred in thirteen, 2 per cent, of the cases. In five, the fetus survived. The mortality in breech delivery was 8.9 per cent and that of delivery of cephalic positions was 0.7 per cent. In cases with version the mortality was 42 per cent. These figures show the futility of prophylactic version. A febrile reaction, or temperature over 38 degrees C, was found during the puerperium in 6.5 per cent of the mothers. This showed plainly that protracted labor and early rupture of the membranes had an unfavorable effect. Vaginal examination did not bear any significant relationship to the postpartum course.

(BRUEHL) WILLIAM C BECK, M D

Cordaro, G : The Antagonistic Action of the Harmonious Motor Functions of the Various Uterine Segments During Labor (L'armonia funzionale motoria antagonista fra i segmenti dell'utero in travaglio di parto) *Riv ital di ginec*, 1936, 10 523

After a short review of the literature, the author presents experimental evidence to show that the motor activities of the corpus uteri, the lower uterine segment, and the cervix are independent and entirely antagonistic, but act harmoniously to effect delivery of the fetus.

Forty virgin guinea pigs of equal age were selected and divided into four groups of ten. Each group was mated at successive intervals with the same males.

In a brief review of the anatomy of the guinea-pig uterus and that of the human, the author compares the cornua to the human corpus, the fusion of the two cornua at the midline to the lower uterine segment, and the so-called neck to the human cervix.

In the first group of tracings, the dynamics of labor for each segment showed: contractions of the cornua, active distention of the intermediate or fused portion, and passive dilatation of the neck. The cornu contractions were high in amplitude and regular; and at almost equal intervals spastic states occurred which were interrupted by small contractile movements. In the intermediate segment the contractions were much weaker, the amplitude was lower, and the pauses were longer, and no spastic phenomena were encountered. The cervix presented inertia which lasted for a time, and was followed by a period of very small contractile movements.

Injections of adrenalin into the animal were found to increase the number, intensity, amplitude, and tone, of the contractions of the cornu; but no effect whatever could be produced upon the intermediate portion and the neck. The drug seemed to exhibit a selective action upon the cornu.

Injections of atropine were found to have no influence upon the motor action of the cornu, but the activity of the intermediate segment and especially the neck was definitely inhibited.

These findings demonstrate that the three segments of the uterus possess quite different motor actions and react differently to the same stimulants. The author explains these phenomena on the basis of the nerve supply, the cornu is innervated by the sympathetic nerves; and the intermediate segment together with the neck is innervated by the parasympathetic nerves.

GEORGE C FINOLA, M D

Luisi, M : Cholesterinemia and Azotemia during Labor and the First Week of the Puerperium (La colesterinemia e l'azotemia dall'epoca del parto alla fine della prima settimana di puerperio) *Riv ital di ginec*, 1936, 19 579

Using the technique of Pregl-Parnas-Wagner for azotemia, and that of Autenrieth and Funk for cholesterinemia, the author reports his observations upon the azotemia and cholesterinemia curves during labor and the first week of the puerperium.

From his results in 180 patients the average values for cholesterol were found to be 215 per cent during labor 140 per cent at the onset of lactation and 170 per cent on the seventh day of the puerperium.

He believes that the blood cholesterol gradually diminishes after labor to return to normal on the 14th or seventh day of the puerperium. The lowest values were encountered at the onset of lactation. The puerperal cholesterol curve is probably allied to the hyperfunction of certain endocrine glands the increased function of which is associated with the mammary function. In the non lactating women the hypercholesterinemia which is encountered on the seventh day of the puerperium is less marked than that in the other women which suggests absorption of some inhibiting mammary involuting substance. In twin pregnancy the values are slightly augmented. There is no difference in the cholesterol curves of primiparas from those of multiparas.

The average values for azotemia were found to be 0.35 per cent during labor 0.48 per cent at the onset of lactation 0.50 per cent on the fifth puerperal day and 0.42 per cent on the seventh day of the puerperium.

From these findings the author concludes that azotemia is augmented during labor and through lactation until the fifth or sixth post partum day when it begins to diminish. The puerperal hyperazotemia is closely allied to the involution of the uterus. In twin pregnancy the values are slightly higher. The hyperazotemia is more marked in primiparas than in multiparas because of the increased duration of labor. The azotemia of non lactating women is higher than that of lactating women.

GEORGE C. FINOLA M.D.

PUERPERIUM AND ITS COMPLICATIONS

Pastore J. B. Postpartum Hemorrhage. *Am. J. Surg.* 1937 33 417

Postpartum hemorrhage is still one of the greatest causes of maternal mortality and morbidity in this country. It is almost impossible to define postpartum hemorrhage since it is an individual problem. A normal blood loss for one patient may prove to be a serious loss to another one.

For practical purposes it is best to express the blood loss in terms of the body weight since the effect of any blood loss is inversely proportional to the total blood volume. For statistical purposes 10 per cent or more blood loss is indicative of postpartum hemorrhage. On this basis a 10 per cent

blood loss would be equivalent to 600 c.c. in the average patient weighing 60 kgm. or to 800 c.c. in a patient weighing 80 kgm. The value of this method is important in the treatment of the patient.

Another prerequisite for the correct evaluation of the effect of the blood loss on the patient is the accurate measurement of the blood loss. This can be done if a technique and apparatus similar to those at Cornell Medical School are used.

The essential factor in the treatment of postpartum hemorrhage is early recognition and elimination of its cause. The best method for early recognition of the source of bleeding is to follow the third stage of labor in its chronological order.

First is the period from the time of delivery of the infant to separation of placenta. During this period perineal and vaginal lacerations may occur then cervical lacerations, and lastly uterine bleeding due to partial separation of the placenta.

The second period extends from the time of separation of the placenta to completion of its expression. Hemorrhage may be caused by delayed expression of a separated placenta or by faulty expression of the placenta. The fundus of the uterus should never be used as a piston in the expression of the placenta because of the unnecessary trauma exerted upon it and because the uterus is usually pushed deep into the pelvis. The fundus may be squeezed and pushed downward with the right hand, but the left hand should prevent it from entering the pelvis by having the finger directed under the symphysis.

In the third period following the expression of the placenta hemorrhage may be caused by stony of the uterus, prolapse of the fundus into the pelvis, perineal and vaginal lacerations, cervical lacerations and special abnormalities such as placenta previa, premature separation of the placenta, myomata uteri, retained placental tissue, inversion of the uterus, placenta accreta, and rupture of the uterus.

Following each delivery we should ask ourselves whether the patient can withstand the blood loss with impunity. We have found that the incidence of postpartum infection increases 400 per cent if the cell volume drops below 30 per cent during the puerperium. We can maintain the cell volume above this level in three different ways: (1) by maintaining as high a cell volume before delivery as possible, (2) by decreasing the average blood loss during the third stage of labor, and (3) by replacing the blood loss by transfusion when the cell volume would drop below 30 per cent. This can be done with the use of charts which have been worked out and are shown in the original article.

STANLEY C. HALL M.D.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Cumming, R. E., and Schroeder, C. F.: Renal Atrophy. *J. Urol.*, 1937, 37, 407

Perhaps "atrophic pyelonephritis" would have been a better name for the condition which the authors discuss than "renal atrophy." Most of the authors' case records indicate the presence of past renal infection, although ordinary investigation did not always demonstrate infection and the evidence was insufficient for the assumption that infection was the only cause of the condition. In some cases there was no sign of persistence of infection. The nomenclature remains confusing. The term nephrofibrosis was proposed, based upon the histopathology rather than the gross pathology. The atrophy was proliferative or replacement atrophy. The terms atrophy and hypoplasia should be sharply separated and the conditions described should be considered as pure atrophic states. Many times, secondary atrophy, due especially to obstruction or infection, was superimposed upon congenital hypoplasia. Accurate definitions of atrophy, hypoplasia, aplasia, and agenesis should be insisted upon. Herbst and Apfelbach separated their cases into two groups: (1) cases in which the kidneys were altered from normal by hypoplasia or aplasia of the metanephric mass, and (2) cases in which the kidneys were altered by inflammation, persistent circulatory disturbances, trauma, and obstructive hydronephrosis. The atrophic element in the combined picture may be due to congenital malformation entirely, such as a blind ureteral bud.

The authors define nephrofibrosis as a localized or diffuse destructive or degenerative condition of the kidney, which may or may not have originated as an infective or infected embolic process, but results in a decreased size of the organ because of fibroblastic proliferation. It must be differentiated from nephrosclerosis, which is a degenerative vascular change in the kidneys associated with generalized vascular disease and has an entirely different cause and different symptoms. The recognition of renal nephrofibrosis clinically is of prime importance as the state of renal sufficiency is of basic value in planning treatment, surgical or otherwise, upon the kidney, ureter, bladder, and prostate. Atrophic kidney is an elusive entity and is often overlooked. Nephrofibrosis involving both kidneys, in contrast to suppurative or inflammatory destruction, may in fact be the actual cause of clinical findings of renal failure. Inflammation may be checked, and suppuration quickly overcome with prompt improvement, whereas in renal atrophy this is not possible except that currently active tissue may be saved.

It is not always easy to recognize any type of atrophy with a negative history, unconvincing urograms, and dye values of relatively normal

limits, the diagnosis is difficult. Some advanced atrophic states cannot be discovered regularly by routine diagnostic procedures. After renal surgery the iliopsoas muscle shadow rarely, if ever, appears normal, except after simple nephrectomy; this deviation includes obscuration of the nephrograms and interferes with interpretations of the renal mass size and alignment.

The causes of nephrofibrosis may be classified as follows: (1) obstruction, (a) infrarenal, and (h) pre-renal, (2) trauma, (3) operation, (4) infection; (a) primary, (h) generalized, (c) localized, (d) toxic, and (e) ascending, (5) calculosis; and (6) idiopathic causes, such as atrophy or disuse.

The authors' cases include the following: primary or underlying disease conditions: lithiasis, 12; traumatic rupture of the kidney, 1; operative injury to the ureter, 3; hydronephrosis, 1; atrophic pyelonephritis, 1; perinephritis, 1; hypoplasia calculus, 1. Two patients with extreme atrophy after ureteral injury were subjected to ureterolithotomy. The instance of perinephritis was unique in that the surgery preceding atrophy was ureteral reimplantation for some evidence of pyelonephritis, but no obstruction. In one case of hydronephrosis which was grossly infected, it is doubtful if the involved kidney was functioning years prior to the nephrostomy. In 20 cases of radical renal resection there were only 3 with recognizable atrophy. In the cases of bilateral lithiasis only a few of the operated or unoperated kidneys became atrophic. Infection seemed to play a more important rôle than the atrophy of disuse. The largest group of cases were those caused by calculosis; even when there was no evidence of renal calculus, there was a strongly suggestive history. The authors believe that the infection accompanying the calculi was no doubt partly responsible for the formation of the calculi and was the prime factor in producing atrophy later.

The authors present the specifically new idea, that even though the lesion in the atrophic kidney appears to indicate an old infarct, the involvement may be due to the results of ascending infection with pyelonephritis, vascular changes, and limitation of the nephrofibrotic areas corresponding to the units supplied by those particular vessels, the end arteries, as they have no anastomosis proximal to the glomeruli supplied. Acquired atrophy and nephrofibrosis develop as a negative response to natural need, and one kidney carries the load of renal function. Its fellow gets no biological urge until sufficient disorder occurs to prevent appreciable recovery. There may be a gradually decreasing blood supply with consequent degenerative vessel changes which prohibit retro-active improvement. Without anticipated or logical reason, certain kidneys simply refuse to function after apparently successful and routine surgery. This startling condition often goes un-

recognized until some circumstance brings a wary roentgenologist to recognize the loss of functional activity a small renal shadow and contralateral renal hypertrophy or until the surgeon finds that his perfectly well done surgery has rendered the at tacked kidney useless.

LOUIS NEUWELT M.D.

Rumpel Kidney Stones with a Special Consideration of Their Increased Incidence (Ueber die Nierensteinkrankheit unter besonderer Berücksichtigung ihres heutigen vermehrten Auftretens) *Klin Wochenschr* 1936 25 9, 2569

The theory of the existence of a calculus diathesis is discounted at the present time and the old theory that renal stones are the result of a local disease of the kidney has again assumed importance. The latter is based on the prevalence of unilateral involvement and the rarity of recurrence after operation for true primary aseptic renal stones. Kidney stones are the result of a disturbance of the functional equilibrium of the kidney which is associated with the regulation of the nerves. The disease is distributed irregularly throughout the world. Definite climatic, geographic or racial influences have not been established. Perhaps it is correlated with changed modes of living particularly with regard to nutrition. Since infant nutrition has improved so markedly stones in childhood have become less frequent. Since 1905 there has been an increased incidence of kidney stones in Germany and Austria but in 1925 the poor nutrition of the postwar period had just ceased. The calcium content of the drinking water which is usually blamed is not responsible for the condition. Previous gonorrheal infections are not the cause. Neither could Rumpel establish the fact that influenza was the cause in any of his cases. He considers that sports which are associated with increased elimination and diminished intake of fluids are entirely a possible etiological factor. In contrast to former times an increased incidence of kidney stones is found in persons from twenty to forty years of age who are in training. Rumpel distinguishes three types of patients.

1. Patients with a primary aseptic stone formation. They are usually males in the third or fourth decade. They experience a sudden onset of renal colic without previous manifestations. There is a predominance of oxalate stones. As soon as these stones reach the bladder the pain ceases suddenly. The stones are frequently passed spontaneously and unnoticed or they remain behind and gradually become larger.

2. Patients with a secondary aseptic stone formation. These patients suffer repeatedly from renal colic but may not have symptoms for years. However permanent disturbances, such as disturbance of the renal secretory function as shown by the methylene blue test take place. The upper urinary passages become dilated and tissue injuries of the mucous membranes and even of the renal parenchyma may be found. Sooner or later infection occurs.

3. Carriers of infected kidney stones. In patients with alkaline urine phosphate deposits or coral stones occur rapidly. Patients with stones associated with malformations of the genito-urinary organs, albumin stones postinfection stones and stones resulting from trauma prostatic hypertrophy or central disease of the nervous system also belong in this group.

Surgical treatment. Rumpel has performed 176 operations in the presence of strict indications. The absence of red blood cells is no contra indication. Cysto copy and x ray studies are necessary. With the cystoscope disturbances in the urinary stream and changes in the ureteral orifices are seen plainly. The methylene blue test practically never fails. The genito urinary tract should be examined without contrast media if contrast media are used immediately, small shadows of stones may be overlooked. Calcium shadows in the region of the urinary passages cannot always be diagnosed as stones with certainty. Intravenous and retrograde pyelography are necessary. The author presents suggestions for the avoidance of errors. The ideal is to be attained in early operation for a demonstrated resting epit stone. So long as colic recurs that is as long as the stone is in motion, surgical intervention should usually not take place. Early operation is particularly urgent in bilateral renal calculus. As aids to mobilization of the stone the ingestion of a large amount of fluid from 2 to 3 liters and mine al water are suggested for ureteral stones injections of oil or glycerum. If it is not possible to displace the stone by a catheter or grasp it with a small stone forceps the bladder should be opened and the stone in the ureter approached directly or if it is in the isthmus, the stone should be removed. The author does not approve of the other endovesical urethral methods as they are more dangerous. Among 74 ureterotomies he had only one fatal due to pyonephrosis in the other kidney. In general two thirds of these stones are passed spontaneously. Advanced age is a contra indication to the operation. Small chronically recurring urate stones should not be treated surgically as a rule neither should the huge bilateral kidney stones which surprisingly cause few symptoms as very little functioning kidney parenchyma is present in cases of this kind.

Choice of operation. The removal of the stones followed by immediate suture is the ideal treatment. Incision of the renal pelvis incision of the renal parenchyma for intrarenal stones and incision of the ureter are also suggested. Palpat on with the fingers and irrigation with saline solution is recommended. The author sees no advantage from x ray study at the time of operation. Immediate suture may be practiced in the presence of mild genito urinary infections. The author does not favor the use of the indwelling ureteral catheter. He believes too many pyelostomies and nephrostomies are being done. In the presence of large coral stones he recommends removal of the kidney as nephrotomy is just as dangerous. In the presence of severe infections he

recommends drainage of the renal pelvis, or better yet, removal of the kidney. Nephrostomy and pyelostomy are indicated for bilateral infected renal calculi and in the presence of a single kidney.

Mortality In 276 cases there were 14 deaths, 5 per cent, after 202 renal operations there were 13, 6.4 per cent, and after 74 ureteral operations there was one, 1.3 per cent. Only two deaths were associated with the early operations, all of the others followed the late operations.

In conclusion Rumpel discusses the recurrences. Among the primary and secondary aseptic cases recurrences followed in only 5 per cent, in the third group they followed in from 25 to 30 per cent. Infection favors recurrence. The author considers the apathetic and resigned attitude of surgeons, due to the high incidence of recurrence, as unjustified. The recurrence indicates the need for early operation. At any rate, patients with a first case of renal stone should not be dismissed until repeated x-ray examination has shown that the genito-urinary tract is free from stones.

The article contains three roentgen illustrations (FRANZ) JACOB E. KLEIN, M.D.

Gasparian, A. M.: Tumors of the Renal Pelvis (Tumeurs du bassin) *J d'urologie méd et chir*, 1936, 43, 130.

This report is based on 11 cases of tumor of the renal pelvis, and a review of the reported cases which total about 400. The incidence was from 7 to 9 per cent of all tumors of the kidney. Males were affected more frequently than females. The average age of the patients was about forty years. Often there were other associated lesions, especially renal calculus and papilloma of the bladder. The average duration of the symptoms in the author's 11 cases was two years. The cause of the tumors was unknown, but renal calculus may have been a predisposing cause.

Histologically, three types of tumors were recognized in the renal pelvis: (1) connective-tissue tumors, which include fibromas, sarcomas, lipomas, and endotheliomas, (2) epithelial tumors, including simple cancer, and (3) fibro-epithelial tumors, which include papillomas and papillary carcinomas. Seventy-five per cent of the tumors belonged to the third group.

Diagnosis was difficult, especially in the early stages. The principal symptom was hematuria, which occurred in from 80 to 85 per cent of the cases. It was or was not accompanied by pain and enlargement of the kidney. The author believes that the hematuria depended more on the situation of the tumor in the pelvis than on its size. The presence of a papilloma of the bladder near the isthmus of the ureter did not exclude the presence of a tumor of the pelvis, but rather favored it. Examination of the urinary sediment for tumor cells occasionally aided in the diagnosis. Cystoscopy and retrograde pyelography were important diagnostic methods, but they did not prevent errors. Incomplete filling was due to

muscular contraction of the pelvis, the presence of a clot of blood, or a non-opaque stone, and did not necessarily indicate the presence of a tumor in the pelvis. In doubtful cases the examination was repeated.

Although many tumors of the renal pelvis were histologically benign, the incidence of local recurrence and implantation in the ureter and bladder was so high, that all should be regarded as malignant and treated as such, i.e., by nephrectomy and ureterectomy. The operative mortality was from 7 to 8 per cent. The end-results were unsatisfactory because of recurrences and deaths within one year of operation.

The author concludes with brief reports on his eleven cases. Nephrectomy was performed in seven. One patient died on the sixteenth day, and autopsy showed metastases to the lung. The others are living and well from two years to five and one half years after operation. M. M. ZINZINGER, M.D.

Biancardi, S.: Ureterocele (Sull'ureterocele) *Arch ital di chir*, 1936, 44, 589.

Biancardi defines ureterocele as a cystic dilatation of the inferior ureteral segment. This lesion is characterized anatomicopathologically by an endovesical and submucous prolapse of the intravesical portion of the ureter which is abnormally dilated. When the bladder is opened, or on cystoscopy, the lesion appears in the form of a pseudocyst which is located at the opening of the ureter into the bladder.

After having reviewed the literature on the subject, the author states that the disease can be studied thoroughly only with the aid of cystoscopy and pyelography. Another important factor in the study of the disease is the high-frequency current which permits endoscopic instead of transvesical treatment.

The author briefly reviews all the cases of ureterocele which have been reported in the literature and discusses the anatomicopathological features of the condition and the most common theories of its pathogenesis.

According to Biancardi, the most important pathological factor of a ureterocele is an obstruction at the orifice of the ureter into the bladder which may be either congenital or acquired. To this obstruction may be added a dynamic factor consisting of a disturbed motor equilibrium between the superior ureteral segments and the intravesical portion of the ureter. These factors lead to the formation of a segmental ectasia of the lower ureteral portion, i.e., the formation of a ureterocele.

With regard to the symptomatology of the condition, there are cases which run an asymptomatic course. The most common symptom is renal pain similar to that found in renal colic. In other cases such symptoms as polyuria, dysuria, tenesmus, and pain in the bladder are by no means uncommon. In females the ureterocele may protrude through the labia minora and be diagnosed on simple inspection.

The differential diagnosis involves neoplasms of the urinary bladder, renal calculi, prolapse of the

ureter, and urethral neoplasms especially in the female

Treatment consists in fulguration of the ureteroceles. The author presents two cases which came under his personal observation

The first case was that of a fifty six year old woman in whom the diagnosis was made by means of ureteral catheterization and chromocystoscopy. Treatment consisted in fulguration of the ureteroceles with a current of from 200 to 250 ma. The patient made an uneventful recovery

The second case was that of a twenty two year old woman who since childhood had suffered from dysuria and incontinence. Following fulguration of the lesion she made a prompt recovery

RICHARD E. SOMMER, M.D.

BLADDER URETHRA AND PENIS

Carl C. Regeneration of the Urinary Bladder (Sulla rigenerazione della vescica urinaria). *Clin. chir.* 1937 13 147

The author reviews the experimental and clinical reports on restitution of the bladder after extensive resection. There is general agreement that a functionally efficient reservoir is formed but disagreement as to the mechanism of the process. The majority of the reports imply that there is a true regeneration which originates from the neck of the bladder or the first part of the urethra

Carl studied the problem experimentally in rabbits. His methods and the results he obtained were as follows

1. Subtotal resection with reconstruction by suture resulted in a functionally efficient reservoir of moderate size complete in all its layers with hypertrophied walls. The capacity was almost the same within a few days after operation as after three months

2. Dissection of the entire mucosa was followed by complete although somewhat atypical regeneration. The epithelium was flattened and the submucosa thickened

3. Extensive resection with conservation of the trigone and ureteral openings was performed without subsequent suture. There was rapid proliferation of granulation tissue from the edges of the residual bladder of which it formed a cylindrical continuation communicating at first with the exterior. The granulation tissue finally fused the edge. The result eighty days after operation was a small bladder of normal structure with thickened walls adherent anteriorly to a mass of fibrous tissue infiltrating the abdominal wall

4. The bladder was resected without suture leaving only the trigone and the ureters were transplanted into the abdominal wall. Four months later the fragment was found buried in fat tissue unchanged in structure but showing no regeneration. Carl believes that this was the first time that the residual bladder was studied experimentally when isolated from all external factors

The last two experiments demonstrate the important function of granulation tissue in reconstruction of the bladder. In the third experiment after having brought together the edges of the fragment the granulation tissue had no further function and, being no longer in contact with urine was reduced to a simple mass of fibrous tissue. A counterproof of the principal rôle of the granulation tissue was afforded by isolation of the fragment from contact with urine. All stimulus to the formation of connective tissue then being absent the fragment remained inert. This experiment demonstrated that the bladder has no inherent power of regeneration in the biological sense, and that for reconstruction some factor in influencing the bladder residuum is necessary. The final structure has been interpreted as a regenerated bladder but this regeneration was purely passive and was expended on the residual bladder which adapted it self in the most opportune manner to compensate for the defect under the influence of factors which were different in every case. After reconstruction by suture the chief factor was distention after resection without suture it was the granulation tissue

The article is accompanied by photomicrographs and a bibliography. M. E. MORSE, M.D.

MISCELLANEOUS

Uebeltoether R. Reflex Anuria (Die reflektionsche Anurie). *Arch. f. klin. Chir.* 1936 187 389

This is an interesting as well as instructive work on the debated topic of reflex anuria, the existence of which is recognized by some and denied by others. The author discusses both viewpoints critically and adds valuable observations of his own. Some of his observations seem to confirm the occurrence of reflex anuria and some when examined critically permit an explanation of the apparent cases of reflex anuria on some other basis. Therefore great care must be taken when a diagnosis of reflex anuria is made

The author has performed some experimental work to decide the question and has conducted numerous difficult animal experiments in which he examined the capillaries microscopically to determine the cause of the renorenal reflex. He produced changes which were similar to the diseases in the human being from which it could be assumed that the supposition that sudden ischemia of one kidney follows severe injury of the other is probably correct. (ROEDERLIS) LEO A. JUNKER, M.D.

Haim A. and Mathewson C. Jr. Lymphogranuloma Inguinale in San Francisco. *J. Am. Med. Ass.* 1937 108 951

The author aims primarily to stress the incidence of lymphogranuloma inguinale in California. Published reports indicate that the disease is becoming more prevalent throughout the civilized world. The material consists of 46 proved cases and a preliminary account of 700 cases in San Francisco

The Frei test plays the most important part in the diagnosis. The antigen employed was made from the pus obtained from one of the patients according to Frei's directions, without the addition of chemical preservatives, which may cause misleading non-specific reactions. Contamination of the antigen must be avoided by all means. The antigen must be tested for its specificity and potency in proved cases and in controls.

In performing the test, 0.1 c.c.m. of the antigen is injected intracutaneously on the flexor surface of the forearm. A red papule appears about twenty-four hours later and increases in size for the next day or two. The reading is made after forty-eight hours, the diameter of the red papule and the surrounding erythematous halo, if present, being noted in millimeters. If the diameter of the papule is 6 mm. or more the condition is present. Smaller reactions are considered questionable.

The positive test gives evidence of an acquired specific allergy, which usually continues throughout life and therefore does not necessarily indicate the presence of a recently acquired active infection. Old, completely healed infections may give positive reactions. Negative reactions may occur when the specific allergy has not yet developed, or when the reaction is suppressed by factors known to lower the allergy in other infections, such as syphilis.

Twenty-three patients, twenty-one males and two females, presented inguinal adenitis due to the virus of lymphogranuloma inguinale. Aspirated material from these glands showed no organisms in smears and cultures in twenty-one. Frei tests were positive in all of the cases. Eight patients had a transient sore on the penis from eight to twenty-one days following exposure. In eight cases complete bilateral surgical extirpation of the inguinal glands resulted in prompt and complete healing without

recurrence and without elephantiasis of the genitals. Incision and drainage alone resulted in persistent fistulas in four cases. In two cases spontaneous regression of the buboes followed a course of intravenous antimony and potassium tartrate.

Twenty-three cases presented rectal manifestations of this disease. The frequent positive reaction of the Frei test in patients with benign rectal stricture is strong evidence pointing to the fact that lymphogranulomatosis inguinale is the cause of this condition. In the cases of fifty-one patients treated for benign rectal stricture, the clinical evidence of lymphogranuloma inguinale together with the absence of other causative factors made it plausible to assume that at least thirty-two of these patients had this disease. Before the Frei test was known many rectal strictures were thought to be of syphilitic or gonorrheal origin.

The author has employed the Frei and the Dmelcos skin tests for chancroid to differentiate between lymphogranuloma inguinale and chancroid and has found them highly satisfactory.

The results of a general survey of 405 adults, 281 males and 124 females, subjected to Frei tests showed negative findings in 94.6 per cent; positive findings in 2.7 per cent, and questionable findings in 2.7 per cent. Many of the patients with positive or questionable reactions had some clinical manifestation suggestive of the disease some time during their adult lives. This was an almost exclusively white population.

The author believes that any venereal infection should be considered as a potential mixed infection and that the Frei test should be used just as frequently as the serological test for syphilis. The frequency of the disease in the white population emphasizes its public health importance.

LOUIS NEUWELT, M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Lombard P. and Fabiani G. Staphylococcal Infections. Secondly Attenuated Aseptic Osteitis from this Cause. (Les staphylococcies secondairement atténuées. Leur ostéites tardive ment aseptique.) *Rev d'orthop* 1936 43 577

The recrudescence that may occur in old foci of osteomyelitis has been recognized for a long time. For this reason the cure of adolescent osteomyelitis is never completely assured. An acute osteomyelitis may subside but organisms of attenuated virulence which are capable of causing low grade suppurations resembling cold abscesses in distant bones persist. Two observations of the latter variety are presented in some detail.

Case I. A native Algerian boy fifteen years old had a year previously passed through an acute episode marked by delirium, high fever and pain and swelling in the left hip. The acute symptoms gradually subsided and at the end of three months he was able to be up and about with the aid of a cane. He entered the hospital pale and emaciated. Examination revealed a large mass of bone consistency in the left internal iliac fossa and diffuse swelling in the external iliac fossa. The hip joint was almost completely immobilized in flexion at an angle of about 45 degrees. About the articulation proper there was neither swelling nor tenderness. The fourth metatarsal bone of the right foot showed a fusiform, painless swelling and an enlargement of the external malleolus was found on the same side.

The radiographic appearances of the above lesions were unusual. The iliac bone was greatly thickened and, while dense in the center was irregularly rarefied at the periphery apparently because of the presence of multiple cysts. Both the head of the femur and the acetabulum showed destructive changes. The metatarsal and the malleolus were expanded and cystic. In the cavity of the malleolus appeared to be a sequestrum.

A resection of the metatarsal bone was performed. Healing ensued by first intention. The cavity in the bone contained an amorphous granulation tissue. Cultures of this material made on a variety of media remained sterile. Later the iliac bone was opened surgically. The cavity contained a turbid serous fluid and a gelatinous material, and showed only a chronic suppurative process upon histological examination. Cultures were again negative.

When the operative wounds healed a hazel nut sized, painless tumor developed on the plantar surface of the left foot over the head of the first metatarsal bone. It developed about five months after the boy was first observed. The lesion was excised. In the center were a few drops of creamy pus and two minute foreign bodies. The pus yielded a pure

culture of staphylococcus aureus. Histological examination again revealed only banal chronic suppuration. The two foreign bodies consisted of bone. A second plantar abscess of the same character developed subsequently and likewise yielded staphylococci. Meanwhile exhaustive tests seemed to eliminate the possibility of tuberculosis, syphilis and any of the mycoses.

A careful study of the staphylococcus and its toxins revealed an organism of low virulence.

Case II. A European child twelve years old suffered from acute osteomyelitis of the right tibia. This condition was treated surgically in the usual manner and an apparent cure was obtained. Three years later the patient reappeared with an abscess over the sternum. It had developed insidiously and without any thermal reaction. No involvement of the bone could be discovered either by radiographic examination or at operation. The pus contained a staphylococcus aureus which, like that in the first case was of low virulence.

In their conclusions the authors fail to exploit their findings in the light of recent bacteriological theory, but instead urge caution in the interpretation of the results of staphylococcal vaccineotherapy.

ALBERT F. DE GROOT, M.D.

Wlensky A. O. Acute Hematogenous Osteomyelitis. Classification of the Cases of Acute Hematogenous Osteomyelitis as Determined by Therapeutic Indications. Results of Operative Treatment. *Arch Surg* 1937 34 320.

Acute hematogenous osteomyelitis presents two features: a generalized bacterial infection and a local bone lesion. The former is the more important as it determines the outcome, and as it is the primary factor it is not removed by operation on the local lesion. The old teaching of urgency and radicalism in the treatment of the local lesion is being changed to one of watchful waiting and conservativeism as osteomyelitis may and does heal spontaneously. Radical operative procedures are unwise and operation, when necessary, should be limited usually to simple incision and drainage.

The purpose of this article is to illustrate by case reports the above contentions and to show that the treatment of acute hematogenous osteomyelitis cannot be standardized. Patients may be divided into various clinical groups. In the first group operation of any kind can be avoided and spontaneous recovery occurs. There is either early retrogression of the osseous lesion or the latter goes through the sequence of necrosis, sequestration and exfoliation. Theoretically each bone focus can act as a secondary point for distribution of infection, but practically this seldom occurs. In the second group the generalized infection is the paramount factor and death results whether the bone lesion is operated on or not.

In a third group the generalized infection becomes controlled and the end-result depends on the local bone lesion. The latter may lead to complications, such as hemorrhage or joint involvement which are fatal, or it may eventually be brought under complete control. It is in this group that radical operative procedures, even complete osteotomy, cause no improvement. After such operations the blood culture may again become positive, secondary foci may appear, and local complications, such as joint involvement and deformities, occur before a cure is finally obtained. CHESTER C. GUY, M.D.

Jansson, G.: Roentgen Diagnosis and the Question of Metastases in Giant-Cell Tumors of the Skeleton (Zur Roentgendagnostik und Metastasenfrage bei Riesenzellgeschwuelsten im Knochen-system) *Acta radiol.*, 1936, 18 303.

Following a review of Kirklin's roentgenological classification of giant-cell tumors into trabecular and totally or partially homogeneous osteolytic types, the author reports three cases which show that the trabecular variety can change into the osteolytic type and that the latter is a more advanced stage of the former. He also shows how after roentgen treatment a tumor of uncertain type assumed the appearance of a giant-cell tumor.

He discusses the question as to whether there are malignant types of giant-cell tumors. The author believes that the giant cells migrate from the primary tumor out into the body.

Freund, E., and Meffert, C. B.: Giant-Cell Tumors of Bone. Experience with Surgical and Roentgen Treatments on a Material of 15 Cases. *Am. J. Roentgenol.*, 1937, 37 36.

The fifteen cases reviewed in this article were those of four males and eleven females. All except four of the patients were between ten and thirty years of age. The cases are reported as follows:

Case 1 A woman of twenty-seven developed a swelling in the right wrist soon after a fall on the extended right hand. The pain was relieved by opening and curetting a cystic tumor in the lower end of the radius. About five months later there was a recurrence of the symptoms, but further treatment was refused.

Case 2 A colored man of thirty-six had had two pathological fractures of the lower end of the right radius before he came for consultation. An extensive destructive lesion of the bone was treated with the roentgen rays without success, and then the tumor was removed and the walls of the cavity curetted. The pathological report stated that giant-cell tumors were present.

Case 3 A woman of twenty-three had a large tumor in the lower end of the radius which resulted from a fracture. Roentgen-ray treatment failed. At operation the tumor was found to have invaded the soft tissues, surrounded the tendons, and invaded the joint. Amputation was done. The pathological report stated that a giant-cell tumor was present.

Case 4 A boy of eight had a cystic lesion in the lateral condyle of the humerus. Curettage revealed a giant-cell tumor. Six months later a second curettage was done and the cavity cauterized with 95 per cent phenol followed by alcohol. No follow-up of the case was made.

Case 5 A woman of thirty had a swelling of ten years' duration at the upper end of the forearm. Roentgen examination showed an extensive multilocular lesion of the ulna. After roentgen-ray treatment for fifteen months, the tumor showed definite improvement and signs of calcification.

Case 6 This patient was a man sixty-four years old. A roentgenogram showed a cystic porotic area in the lower end of the ulna suggestive of giant-cell tumor. No treatment was given.

Case 7 The patient was a woman aged twenty-one. She presented a swelling just above the outer condyle of the femur which appeared as a large cystic area surrounded by osteosclerosis in the roentgenogram. It had been curetted once. The patient had worn a cast and then a brace. Roentgen treatments were given but the results could not be followed up.

Case 8 A woman, age twenty-four, had severe pain and swelling in the knee for three years. A cystic lesion was revealed by the roentgen rays. The bone appeared to be blown up and the cortex very thin. At operation a multilocular cystic tumor was curetted and a bone graft from the tibia inserted to fill the gap. The pathological report was giant-cell tumor. Examination five years later showed a good recovery with almost perfect knee motion.

Case 9 A man of forty-eight had a fracture through the lateral condyle of the femur which on roentgen examination was found to have been due to a typical giant-cell tumor of the condyle extending down to the joint. The knee was immobilized and roentgen treatment given without effect. At operation a large cyst was opened and curetted. The pathologist reported a giant-cell tumor. Progress was poor in spite of subsequent roentgen treatment. Further curettage or amputation was advised, but the patient refused.

Case 10 Following a traumatic dislocation of the knee in a girl of eighteen, there was pain and swelling. A large tumor over the lateral condyle proved to be cystic and presented a thin cortex, as shown by the roentgen rays. The large cavity was curetted and bone chips from the tibia were used to fill it in. The pathological report was giant-cell tumor. The girl made a good recovery with good osteogenesis from the bone chips.

Case 11 The roentgenogram showed a destructive lesion of the lower end of the tibia in a woman of twenty. Operation showed a well encapsulated tumor, frozen section of which was reported to be sarcoma. Further study led to the diagnosis of giant-cell tumor; and instead of the proposed amputation, a thorough curettage was done. A good recovery was made up to five months, but there is no further report.

Case 12 In a girl of sixteen a tumor in the lower end of the tibia began to grow rather rapidly after an operation for bone cyst. The roentgen rays showed a very thin cortex and cystic area in the tibia. There was soft tissue involvement and the tumor presented an 'onion peel' appearance. Since the tumor appeared to be malignant, amputation was done. Further study of the sections revealed an advanced stage of healing in a giant cell tumor.

Case 13 A woman of twenty four had a recurrence of a tumor just below the knee eight months after operation. It was found to be a multilocular cystic tumor of the upper end of the fibula. The entire upper end of the fibula was resected. The pathologist reported a giant cell tumor. There was no recurrence after five years although some soft tissue tumors were removed from the popliteal space about a year after the operation.

Case 14 A woman of twenty three with a destructive lesion of the upper end of the fibula made a good recovery after curettage. The pathological report was giant cell tumor. There was no recurrence at the end of a year.

Case 15 A woman of twenty five had a tumor removed from the upper end of the tibia. The tumor proved to be of the giant cell type. About two years later the woman fractured the bone at the site of the lesion. It healed well in a cast; there is no further report.

Some observers consider localized osteitis fibrosa bone cysts and giant cell tumors as different morphological manifestations of the same pathological process. Some bone cysts are derived from cystic degeneration of giant cell tumors. However true bone cysts occur usually at a much younger age than giant cell tumors and it is difficult to believe that both lesions can be essentially the same. Further more the cysts usually occur in the shaft or metaphysis while the giant cell tumors have a predilection for the epiphysis. Cysts are more frequently found at the upper end of the bone and giant cell tumors at the lower end.

Trauma is much less frequently a factor in giant cell tumors than in cystic lesions. As to healing the cysts are much more benign and tend to heal spontaneously but the giant cell tumors show local recurrence in many cases.

It is noted that in this series twelve cases were treated surgically but only two Cases 10 and 14 showed definite improvement from the operation. In two there was no healing after curettage. Five cases had a local recurrence after operation, one of them three times. It seems that surgical interference is not always satisfactory in giant cell tumors but the best results are obtained if the tumor is widely resected into healthy tissue and if healthy bone chips are inserted.

Only five cases were treated with the roentgen rays. In three of them there was good response and in two failures. Both failures occurred in cases of pronounced clinical local malignancy. In such cases,

even though they are benign from a strictly pathological standpoint the clinical local malignant character usually justifies amputation as it is the only sure cure.

The conclusion from this study of fifteen cases of giant cell tumor and forty cases of osteitis fibrosa is that localized osteitis fibrosa is not the same as giant cell tumor at least not clinically.

WILLIAM ARTHUR CLARK M.D.

Boehler L. Origin Prevention and Treatment of Myositis Ossificans Traumatica (Entstehung Verhuetung und Behandlung der Myositis ossificans traumatica) *Chirurg* 1936 8 377

Boehler considers the cause of myositis ossificans traumatica to be awkward corrective exercises which lead to new muscle tears and especially unskillful after care too forceful massage energetic passive motion and the use of mechanical exercise apparatus. Renewed bleeding swelling and passive hyperemia result. Rider's bone and ossifying myositis from exercise have the same origin. Tears in the adductor muscles of the thigh and in the shoulder muscles are not permitted sufficient rest for healing for the recruit is compelled to continue riding and exercising. The calcium salts deposited in the necrotic tissues assume a linear shape under the influence of activity. The extension of the ossifying process in the muscle is proportionate to the awkward inappropriate treatment with inadequate rest. According to the author early and protective care the resting position in a firm unpadded cast and more active motion in all other limbs improve the general circulation and prevent ossification of the muscles. Nevertheless ossification of adhesions in the vicinity of a joint frequently cannot be prevented in spite of proper and restful corrective positions. Muscle calcification may be recognized as cloudy shadows on roentgen films after from three to four weeks. Retrogression may still occur with proper rest but after from three to four months retrogression does not occur. The author submits twenty nine cases of elbow trauma. Only in three was there a mild degree of myositis ossificans. In two in spite of orders massage was used in the third case severe agricultural work was done immediately after removal of the plaster cast.

According to the author roentgen irradiation is superfluous and its curative influence has not been proved. In 1893 Nimmer recommended excision as the only effective treatment. In 1900 Dannehl reported the views of the German Sanitary Commission. The Commission found that the injury of operation was more apparent than its benefits. According to the review of Schulz in the German army in the years 1897 to 1907 inclusive ninety nine patients were operated upon with the result that twenty six had to be discharged from active service. The author recommends that operation be reserved for severe disturbances of function especially ankylosis. Surgery should not be attempted before a year after the original trauma. The

periosteum should be removed with the diseased muscle. Operation must be followed by a rest interval of three weeks. The author reports two of his own operative cases.

(PLENZ) JACOB E. KLEIN, M.D.

Coley, B. L., and Pierson, J. C.: Synovioma. *Surgery*, 1937, 1: 113

One of the first cases of primary synovial tumor was reported in 1865 by Langenbeck. In 1927 Lawrence Smith introduced the term "synovioma." In 1931 Razemon and Bizard found seventy-four cases of primary tumors of the articulations in the literature, of which twenty-nine were classed as malignant fibro-spindle-cell sarcoma. Eight of these might have been classed as synovioma. Three of the eight patients died of pulmonary metastasis within one year. In two cases reported by Wagner in 1931, one patient died of pulmonary metastasis after ten years and the other is well three years after local excision at the ankle. Several other cases are cited from the literature, in which most of the patients died of metastases.

Since 1900, twenty-four cases of synovioma have been observed at the Memorial Hospital, New York, fifteen of which have been carefully followed. The age of the patients ranged from nine months to sixty-four years, only two were under sixteen. There were eight males and seven females. The primary lesion was in the knee in seven cases, in the foot in three, in the hand in two, and in the ankle, finger and toe in one case each. The treatment in eight cases was local excision and irradiation, and in three, excision and amputation. Amputation was done alone in one case, excision alone in another, and excision followed by irradiation and the administration of Coley's toxins was done in a third case. Eleven of the patients are still alive from six months to five years after the onset of the condition, one of them has pulmonary metastasis after four years and is considered a hopeless case. Four died from one to seven years after the onset of the condition.

In the early stages, pain may be the only complaint. It is dull and aching in character and is worse on weight bearing. The joint function is often unimpaired and roentgen-ray examination is usually negative. The nature of the growth is usually not suspected until the pathologist makes his report after exploratory operation.

Diagnosis is difficult because there may be no palpable tumor. When a tumor exists, it is firm, well circumscribed, homogeneous, not very tender, and most frequently near the knee joint. The hips, elbow, and shoulder were not involved in this series of cases, nor have they been found involved in cases reported in the literature.

Treatment by irradiation alone is not justified because these tumors are not radiosensitive. Local recurrence may be due to the fact that the first surgical excision may have been inadequate. After recurrence, amputation is advisable rather than

further conservative treatment. Lung metastases should be ruled out before amputation is done. On the whole, it seems that in most cases, the early treatment has been too conservative.

A review as to prognosis shows that 20 per cent of the patients survive five years and 40 per cent survive three years. None is on record as having survived as long as ten years.

WILLIAM ARTHUR CLARK, M.D.

Björkroth, T.: A Short Review of the Pathology and Clinical Symptoms of Rupture of the Biceps Tendon; Case Reports (Kurzer Ueberblick ueber Pathologie und Klinik der Bizepssehnenrupturen nebst einigen Faellen). *Acta chirurg Scand*, 1937, 79: 280

On the basis of a few cases of rupture of the biceps tendon the author gives a brief review of the pathology and clinical symptoms, and calls special attention to the diagnosis and treatment of this condition. He discusses the view held that the traumatic factor is subordinate to arthritic and periartritic processes as a cause of rupture. As in many cases no pathologico-anatomical and roentgenological changes were found and also because of the peculiar character of the topographical anatomy of the long biceps tendon, the author believes that in most cases some mechanical factor is the cause of the rupture. He describes the so-called delayed-rupture of the tendon of the extensor pollicis longus and refers to two cases of his own in which the rupture seemed to have some definite relation to a previous luxation; and discusses the possible significance of dislocation of the humerus. Many cases may be overlooked and go under the name of chronic arthritis.

The author describes two cases each of the rare rupture of the common tendon and the short tendon of the biceps, and six cases of rupture of the long tendon of the biceps which were treated at the Norrköping Hospital. Operative treatment is usually preferable. Direct suture of the tendon should be avoided definitely as long as the rupture is not located near the tendon-muscle boundary, which is not often the case.

The author discusses the different operative methods and describes the method carried out in four cases. The tendon is taken in the form of a loop through a small canal under the greater tubercle and attached. The results of the operative treatment are generally good and justify more extensive use of this method.

Schneider, E.: The Pathogenesis and Hypothesis of Malacia of the Lunate Bone (Zur Pathogenese und Begutachtung der Lunatummalacie). *Arch. f. klin. Chir.*, 1936, 187: 617

In clinical observations of sixteen cases of perilunar dislocation and after fracture of the lunate bone, malacia of the carpal semilunar bone was never seen. The dislocated lunate bone takes on an atrophy to the same degree as the remaining carpal

bones. Schneider had previously believed that disturbance of the metabolism regulating mechanism was the cause of septic necrosis and now is able to offer proof relative to malacia of the lunate bone. Such regulatory damage is seen only in the early stages of the unrepaired state and not in the healing stages. A single trauma does not bring on the disease; the condition follows an injury when there is a predisposition to it or the constitution of the body harbors a regulatory defect.

It is noteworthy that before the diagnoses were established periods of from one month to twelve months elapsed. The longer periods were due to the frequent chronic course of the condition. It is difficult to prove regulatory disturbances and it can be done only by investigation of the vitamin status especially in the early phases of the disease.

The treatment consists of immobilization for functional restoration and correction of the regulatory deficiency by supplying Vitamin A or Vitamins A and D. Operation is indicated only when there is no improvement after three months' special treatment as outlined. The lunate bone is exposed through a longitudinal dorsal incision and after drilling small bone chips taken from the radius are packed into the defects.

(WEAVER BLOCK) JEROME G. FINDEA, M.D.

Chinaglia, A. Acute Osteomyelitis of the Vertebral Column. (*L'osteomielite a'uta della colonna vertebrale*). *Arch. Ital. di Chir.* 1936 44 517.

Chinaglia observed a case of acute osteomyelitis of the spinal column in a young farmer whose clinical history was essentially negative. When seen at the clinic the patient complained of severe pain in the region of the lower incisor teeth. On examination he presented phlegmonous lesions involving the lower dental arch and extending into the entire submandibular space. The teeth were loose and lying in a pool of pus. Following drainage and extraction of the damaged teeth the patient's condition improved and he was discharged from the hospital.

After one month the patient returned to the clinic with a rigid neck and an elevated temperature. Pressure upon the spinous process of the first two cervical vertebrae elicited considerable pain. Roentgen examination revealed typical osteomyelitic lesions. The neck was immobilized and the posterior wall of the pharynx was incised to insure adequate drainage. Agar plates inoculated with the pus yielded *Staphylococcus pyogenes aureus* in pure culture. Within a few days the patient's condition grew worse and he died eight days following re-admission to the hospital.

The autopsy revealed osteomyelitic changes involving the dens epistropheus. The lesion extended inferiorly into the body of the axis and the right superior articular surface. The atlas presented carious lesions at the left superior articular surface and the corresponding segment of the anterior arch. Lesions were found also at the left occipital condyle which was nearly completely destroyed. There was

also a localized medullary and pontine fibrinopurulent leptomeningitis.

Following the report of this case the author tabulates all the cases of acute osteomyelitis of the spinal column which have been reported in the literature. Two hundred and sixty-six case reports were collected. They include the name of the observer, the year of publication, the age and sex of the patient, the site of the lesion, the number of involved vertebrae, the treatment and results obtained, the type of preceding trauma, the radiological findings, and bibliographical references.

From this study Chinaglia draws the following conclusions:

Most patients were found to be in the second decade of life. Males were affected more frequently than females. The causative organism was predominantly the *Staphylococcus pyogenes aureus*. Trauma was found to be responsible for the condition only occasionally. Usually only one vertebra of the lumbar segment of the spinal column was involved and most frequently only its arch.

The author believes that surgical treatment of the vertebral body does not yield satisfactory results in the cervical and thoracic segments but splendid results are obtained in the lumbar segment. Surgical treatment of the vertebral arch is favorable in all the segments of the spinal column. The total mortality is 46.40 per cent.

Roentgen examination is usually of no great value for diagnosis inasmuch as positive results are obtained only rarely. **RICHARD E. SOMMER, M.D.**

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

McKee, C. H. A Comparison of the Results of Spinal Fixation Operations and Non Operative Treatment in Pott's Disease in Adults. *Brit. J. Surg.* 1937 24 456.

For practical purposes it must be held that a tuberculous focus always carries the danger of containing live tubercle bacilli. Since resection of the lesion is impossible in tuberculosis of the spine the result to be hoped for is encapsulation by fibrous tissue with sufficient immobilization to prevent liberation of the bacilli and reactivation of the disease. Spinal fixation operations were enthusiastically advocated in America when first suggested about 1910 but the English were more cautious and the present consensus seems to be that such operations should be performed only when the disease is in the end result stage.

To compare the end results obtained by the two methods of treatment 100 cases of Pott's disease in adults treated by non-operative means were carefully compared with 50 cases treated by fixation operations. The 150 patients selected for this study were all over sixteen years of age at the commencement of the disease. The lesions were all in the thoracic or lumbar regions and were in an early stage when treatment was instituted. All patients

were at the same sanatorium and were treated and observed by the same group of physicians. The cases were carefully followed and classified according to the radiological appearances of the initial lesion and end-result, and the clinical end-result after from a three to five years' follow-up. This study has shown that the non-operative or conservative treatment gave good radiological results in 62 per cent of the cases and good clinical end-results in 70 per cent. Late abscesses developed in 4 per cent. The operative treatment gave good radiological results in 38 per cent and good clinical results in 32 per cent. Late abscess formation appeared in 40 per cent.

The type of initial radiological lesion is important in the prognosis with non-operative treatment. Ninety-four per cent of the minimal initial lesions, tuberculous epiphysitis, obtained good radiological end-results. When two vertebral bodies were involved, the end-results was good in only 50 per cent, and when more than two were involved, in only 43 per cent.

The length of time required for conservative treatment of Pott's disease in adults is remarkably constant at eighteen months. In children it is much longer. Immobilization in bed on a frame or in a plaster jacket is required for one year, then two months' freedom is allowed in bed, and three months of being up and about with a spinal brace.

With operative treatment the patient is incapacitated for one year. This is a saving of six months' time but with only half as many good end-results. Fusion operations are contra-indicated in the active stage of Pott's disease in adults as they tend to prevent consolidation between the vertebral bodies at a later stage in the healing process. They should be used only for permanent cure by internal support in cases of fibrous union when the optimum degree of anterior consolidation has been obtained by conservative measures. The operation is probably done best with an autogenous tibial graft combined with obliteration of the posterior articulations. It is most important that the diseased area only should be immobilized because immobilization of healthy intervertebral joints predisposes to recurrence of the disease.

CHESTER C GUY, M D

FRACTURES AND DISLOCATIONS

Block, W.: Mistakes and Dangers in the Traction Treatment of Fractures (Fehler und Gefahren bei der Zugbehandlung der Knochenbrüche). *Arch f klin Chir*, 1936, 187: 195.

The success or failure of the treatment of fractures depends upon the observance of many details. Adequate adhesive plaster dressings require firm adhesion and skin compatibility. Because weights act only indirectly, they must be considerable. They must be applied above the fracture site in order to relax the muscles inserted in the distal fragment. Circular bands to secure the longitudinal strips produce nutritional disturbances which may appear

especially from rotation pull. The plaster sole traction apparatus of Sagar slips easily because of the small surface for its application on the back of the foot, and his flannel extension bandage for the hand may produce congestion and all its sequelæ because the flannel strips which are interlaced between the fingers may constrict. Zinc lime adhesive bandages usually do not have sufficient adhesive power to give long-continued traction. The distraction clamp plaster-of-Paris bandage of Hackenbruch is dangerous because it may produce pressure sores at the projecting bone ends to which it must be attached. In general, plaster-of-Paris bandages are immovable dressings, and not traction bandages. The Steinmann-nail traction method acting directly on the bone has been very efficient. Maintenance for longer than three weeks unfortunately often results in necrosis of the drill hole and infection. The nail must be solid in the bone. If because of biological reaction it no longer is solid, it begins to wander. The variations of the nail method, such as the traction tongs methods described by Schmerz, Schomann, and Demel, have the same sources of danger but to a greater degree. Klapp introduced the wire-traction treatment which is also efficient and therefore frequently mentioned at the same time as the Steinmann nail. The nail and wire traction methods cannot be placed on a par, however, because the wire traction demands an entirely different technique and apparatus than the nail traction, and because the reaction of the bone to the thin wire is different from its reaction to the much thicker nail. If in nail traction the danger of infection lies essentially in the necessary thickness of the nail, in the thin wire it lies in the sometimes insufficient tension on the wire so that it bends under pull and then presses on the skin and also leads to infection. As the outstanding principle for every form of wire traction, it is important that the wire is always so passed through the soft parts and that its suspension by a spreading or tension apparatus is so fastened that the efficient force of the pull acts exclusively on the bone, and the skin and the soft parts remain absolutely free from any pull and pressure, even though the wire may go straight transversely through the bone, or grip it at an angle or in a semi-circular or bayonet form. A preliminary stab incision before the insertion of the wire is prohibited. In case of slight distortion of the skin by the wire under traction an additional small skin incision should be made immediately in the direction of the pull; in greater distortion a new wire should be inserted. An occasional inflammation will drain through the skin drill holes. Serious infections are very infrequent. It is important that the wire does not slip back and forth in the bone, therefore bows should be fastened suitably by a bandage in the form of a double figure of eight around the section of the affected limb, or by a felt pad placed around the wire between the surface of the limb and the arm of the bow. The longer the wire is in place, the less is the danger of infection, because after eight days the

body provides the drill hole with a protective wall. Secondary injuries from nail and wire traction are to be avoided by suitable technique. The fragments may be replaced together in the different distraction appliances with the accuracy of a clock maker. However, there is danger of overpull which may be removed through check with a tape measure and roentgenograms.

The author discusses the dangers of excessive traction that may lead to disturbances of the circulation, formation of unstable joints, delayed fracture healing and non union and also roentgen ray injuries. The mistakes and dangers due to unsatisfactory fixation of the fragment, and too much motion and finally those due to the position of the broken limb are described. None of the hitherto allied traction methods for the treatment of fractures is free from mistakes and dangers and even the most efficient, the direct traction on the bone carries with it peculiar dangers. The wire traction method is by far the best, the most difficult technically but comparatively with the least dangers. Mistakes can be avoided absolutely by a mastery of the technique and the dangers reduced as far as possible by sufficient experience. BARBARA B. SIMSON M.D.

Lafitte H. Intramedullary Bone Grafting in Diaphyseal Fractures (*Enchevilement intramedullaire des fractures diaphysaires*). *Rev. d'orthop.* 1937 24: 132.

Lafitte studied the results obtained in treating diaphyseal fractures by means of intramedullary bone grafts. This method had been employed in all those cases in which a closed reduction was impossible or in which a reduction would not have yielded any results.

The author reports briefly the results obtained with this method in a series of sixteen cases involving fractures of various long bones. He discusses (1) the immediate sequelae, (2) the secondary sequelae depending on the type and duration of immobilization and (3) the late sequelae such as the functional results, the tolerance of the graft and the state of the diaphysis.

Concerning the immediate sequelae the author emphasizes that in practically all of the cases the postoperative course had been a quiet even in cases of compound fractures.

The duration of immobilization ranged from three and one half months for the femur and two and one half months for the legs to two months for the humerus and one and one half months for the forearm. It was imperative to use a light immobilizing apparatus so that function was possible. The activity of the adjacent articulation could thereby be maintained.

The author states that in all of his cases the functional results were excellent. The graft was always well tolerated by the patient. As time elapsed the graft gradually disappeared and usually in three years no evidence of the fracture could be seen on roentgen examination.

The author concludes by stating that in intramedullary bone grafting we possess an excellent means of reconstructing the shaft of the bone provided that certain simple rules are observed. It is imperative to bring the diaphyseal fragments in exact juxtaposition and to keep them well aligned. Moreover, imperfect immobilization may lower the resistance of the fragments and produce a slight angulation. An apparatus for restraint is necessary.

The author finally points out that this method should not be used indiscriminately in all cases of diaphyseal fractures. He recommends it especially in cases of pseudarthrosis but it may be employed successfully also in cases of delayed union in fractures of the radius and ulna and in certain fractures of the femur, especially if all the attempts at a closed reduction have failed.

Poorly reduced fractures of the arm and leg constitute also fairly good indications for this type of surgical intervention and the clavicle may be treated in this fashion if the fracture is in the middle portion and there are no comminuted fragments.

If the original fracture is compound, asepsis must first be obtained before any surgical intervention is attempted. RICHARD E. SOMMER M.D.

Zneng H. G. and Heidemann H. Fractures Cysts and Pseudarthroses of the Navicular Bone. An Investigation (*Navikularfrakturen, Navikularzysten und Pseudarthrosen. Eine Nachuntersuchung*). *Arch. f. klin. Chir.* 1936 183: 395.

This work is based on the material observed in the Koenigsberg Clinic during the past ten years. There were 383 fractures in all, among the 6 were 466 fractures of the radius and 54 fractures of the navicular bone. There was about 1 navicular fracture to 10 fractures of the radius. The frequency of the navicular fractures in relation to the total number of fractures in this series was 1.3 per cent.

In the majority of the cases (81 per cent) it was ascertained from the history that the fracture resulted from a fall. In 5 cases the history gave no explanation and in 3 another process caused the fracture. Dorsiflexion of the hand during the fall was common in all of these fractures. In this position the ligaments fixed the bones together and the navicular bone lay in the long axis of the radius so that any force applied to the radius was transmitted forcibly to the navicular bone. If the forearm was at an angle of from 45 to 90 degrees to the ground at the time a navicular fracture followed if the angle was greater the radius broke. By other authors the so called bracket form of the radius is given a special importance in the mechanism of the navicular fracture. The authors found the bracket form in only 6 per cent of the cases. The authors then presented the different classifications of these fractures. From the roentgen viewpoint the mechanism of a fracture can be made out only if the fracture is not complete, i.e. if only an infraction is present and not a smooth oblique fracture. Compression fractures are recognized roentgenologically only if the

fracturing force has been considerable, also if immediately after the trauma a cyst in the navicular is demonstrable. The authors have seen no such cases in their series. The earliest cyst which they saw was stated to be found three weeks after the occurrence of the accident. The authors are of the opinion that it is a question of rapid repair, i.e., the formation of inferior tissue. In a completely formed cyst a necrotic central portion which is filled with connective tissue or, in fresh cases, with a blood clot is seen. Around this portion occurs also a zone which is not more differentiated, but is less strong. Cordes calls this zone the "repair zone." Next comes the zone in which the bone structure is still retained. The formation of a well-formed pseudarthrosis, which may also develop from a cyst, takes substantially longer. The authors saw the earliest pseudarthrosis well developed after one year. The authors can state in common with other authors that a pseudarthrosis has as a result a more or less considerable osteo-arthritis deformans, in two-thirds of their cases this could be observed. The causes of the pseudarthrosis vary. According to Luetzeler the injury to the periosteum plays the chief rôle. Early preferred functional activity with its imperfect fixation of the fragments makes bony consolidation impossible in poor endosteal callus.

The clinical symptoms were not entirely definite. Pain on pressure over the snuff box was for a long time given as the classical symptom of navicular fracture. According to Blumer this pain on pressure also occurred after fracture of the radial styloid. The authors found swelling of the wrist and localized tenderness in 50 per cent of their cases; limitation of motion, especially in dorsiflexion, in 37 per cent, and weakening in closing the fist in 12 per cent. Clinically only a tentative diagnosis could be made. Only the roentgenogram can be decisive. According to the experience of the authors the fracture is best shown with the hand in ulnar abduction.

The operative treatment is the method of choice in cases of complete shattering of the navicular bone and of painful pseudarthroses. The functional treatment is to be completely discarded on account of the danger of the formation of pseudarthrosis and the occurrence of arthritis deformans. The conservative method remains as the sole efficient method of treatment. In fresh fractures, fixation must be maintained for from four to eight weeks, in old fractures, for months. Treatment of a stationary pseudarthrosis by conservative means is absolutely hopeless for the medullary space is completely closed, and this closure prevents the possibility of endosteal callus formation. For these cases the drilling method of Beck is employed with good results.

BARBARA B. SIMSON, M.D.

Reich, R. S.: The Treatment of Intercondylar Fractures of the Elbow by Means of Traction. *J. Bone & Joint Surg.*, 1936, 18: 997.

Intercondylar fractures of the elbow are due to direct violence, such as a fall on, or a direct blow to,

the olecranon, and often present difficult problems of treatment because of the complexity of muscle attachments to the bones in and around the elbow joint which cause unusual deformities. Two general types of intercondylar fractures are described.

1. T fractures, in which the distal humeral shaft is fractured transversely, and the condylar and articular portion of the humerus is fractured vertically and pulled dorsally, displacing the elbow joint in that direction. Frequently the humeral shaft is driven between the condylar fragments, which results in complete dissolution of the elbow joint.

2. Y fractures, which may occur in either the capitulum or the trochlea. When the fractured capitulum is displaced upward, it carries the radius with it and the ulna slips into the fracture line and separates the condyles. When the trochlea is fractured, it is also displaced upward with the ulna, and frequently it injures the ulnar nerve. Ulnar-nerve injury should always be looked for in this type of fracture.

Treatment is difficult since no method of direct mechanical fixation maintains reduction because of the constant and diverse muscle pull, and severe disabilities result. Skeletal traction is recommended to overcome the over-riding of the humeral shaft. It is done by inserting the prongs into the epicondyles of the humerus. After the distal fragments have been properly separated from the proximal ends, gradual approximation can be accomplished by tightening the ice tongs and at the same time firmly fixing the fragments. The skeletal traction is accomplished with a specially constructed Jones humerus splint with an 18 in. extension on the traction portion, to which the ice tongs are lashed. This permits the patient to be ambulatory. In cases in which the patient is confined to bed, a Thomas arm splint with a right-angle hinged extension from the elbow is employed, and the ice tongs are lashed to the end of the Thomas splint.

The angulation of the humeral shaft may be controlled by forward traction on the forearm, which is fixed to the extension of the Jones humerus splint, or the hinged extension of the Thomas arm splint. The fracture is carefully checked by successive roentgenograms and the traction and consequent tightening of the distal fragments are thus controlled. Y fractures are treated by the same method. The ice tongs are inserted in the medial epicondyle first to avoid ulnar-nerve injury. Instead of straight downward traction as in the T type fracture, the ice tongs are angulated to the side opposite the fractured epicondyle until alignment has been obtained.

Six patients were treated by this method, two with T fractures and one with a Y fracture presented good results. Fair results were obtained in two, one with a T fracture and the other with a Y fracture. The sixth patient presented a poor result. In this instance, the treatment had to be discontinued because of the marked comminution of the fragments.

Skeletal traction must not be applied for at least from five to ten days following an injury and in

compound fractures the wound must be thoroughly and completely healed. When there is severe edema and marked soft tissue injury it is advisable to wait. Traction with the ice tongs is also contra indicated in cases in which there is such marked comminution of the intercondylar fragments that the prongs do not gain purchase when applied. Infection in or around the elbow joint is obviously also a contra indication to the use of this method.

Bailey W. Anomalies and Fractures of the Vertebral Articular Processes. *J Am W Soc* 1937 108 166

The author discusses the anomalies of the vertebral articular processes and makes a careful differentiation between them and fractures of the articular processes. He discusses the cause of the anomalies and states that at least three have been suggested: the most likely one being accessory centers of ossification or ununited epiphyses. The epiphyses are frequently bilateral and may be multiple. Fractures of the articular processes associated with severe injuries of the spine are not uncommon. Isolated fractures are extremely rare. Differential diagnosis lies in the history of twisting trauma of the spine with severe disabling pain. Roentgenographic examinations, both lateral and oblique, show characteristically irregular lines in the fractures. Bailey notes nineteen cases of anomalies reported in the literature to which he adds ten of his own.

The article is illustrated by roentgenograms and drawings. **BARBARA B. STINSON, M.D.**

Studemester A. Coxa Valga Luxans (Coxa valga luxans). *Beitr z klin Chir* 1936 164 370

The author summarizes the results in 1906 cases of coxa valga luxans reported for the first time by Klapp. Coxa valga luxans which is characterized by subluxation of the femoral head, a steep drop of the neck of the femur and a flattened acetabulum is at present generally regarded as an aberrant type of congenital hip dislocation and like the latter is believed to be the result of arrested development caused by some endogenous factor. The abnormally flat and oval form of the acetabulum is supposed to be the primary cause and the valgus of the upper femoral end the secondary. The latter deformity is a result of irregular function. The occurrence of subluxation of the hip without enlargement of the angle of the femoral neck does not justify dropping the classification 'coxa valga luxans' in favor of the more comprehensive term 'subluxation of the hip.'

When roentgenological examinations for suspected coxa valga luxans are made (false projection of the upper end of the femur should be avoided by the correct placing of the leg. The Marburg Clinic follows Harknbroch in raying the pelvis with the legs placed in the mid line and the knees directed definitely upward. The clinical signs of coxa valga luxans which often appear in advanced age as functional disturbances and readily turning legs with

hip pain are outward rotation of the legs while the patient is in the recumbent position, normal active adduction, the positive Trendelenburg sign, wide lateral displacement of the trochanter major, the formation of a depression in the median inguinal region and a waddling gait and atrophy of the entire leg. In the Marburg Clinic 46 per cent of the patients were between the ages of fifteen and twenty five years. It is safe to assume that coxa valga luxans occurs oftener than reported in the literature. Eleven cases were described up to 1931. The inheritance of coxa valga luxans is proved and therefore the racial hygienic laws of congenital hip dislocation as established by Lange must be equally applicable to this deformity.

The treatment of coxa valga luxans will vary with the age of the patient. During early childhood it is subluxation is treated like the congenital hip dislocation quite naturally, the regular bloodless reposition according to Lorenz or Lange with seldom be necessary. During adult life treatment such as the trochanter osteotomy of Bayer, Lörz or Schanz must be considered. Klapp repeatedly employed these methods with success. The only methods that directly attack the causes of this deformity are the plastic operations of Spitz and Lance. Last spring the latter operation was done at the Marburg Clinic with complete success. The prognosis for operative interference is unfavorable only in older patients with arthritic changes. Due consideration must be given to Klapp's mobilization of the hip joint as well as surgical ankylosis of the hip. **(KEMPE) MATTHIAS J. SEIFERT, M.D.**

Felsenreich F. How do Non Unions and Other Unfortunate Results Arise after the Nailing of Fractures of the Neck of the Femur? (Wie entstehen Pseudarthrosen und andere Misserfolge nach Nagelung meiste Schenkelhalsbrüche?) *Zentralbl f Chir* 1936 p 2843

In this detailed work well provided with illustrations which give numerous suggestions for the insertion of the nail the author states that unfortunate results after the nailing of the femoral neck depend essentially upon technical errors. He has improved the Smith Petersen nail in that he has widened the flanges about a mm and sharpened the individual flanges. Non union can be avoided by absolute immobilization of the fragments and making full contact of their surfaces. Ideal reduction, ideal position of the nail, the relation of the broadened pin and saving the osteosynthesis from premature strain are the factors which may prevent non union. The necessary absolute immobilization is guaranteed by the correct position of the nail. In fuller detail the author describes the results of an essentially placed nail. The emergence of the nail from the head can occur from sheer force but also and above all from the outward rotation of the shaft and the accompanying opposite rotation of the head. This rotation occurs when the nail is in an anterior posterior or caudal quadrant. These

positions are represented in a very interesting way by clear and instructive sketches, which explain the difficulty of estimating the wandering of the nail.

The author then discusses the technique of the nailing. He does not agree with Voss who has caused confusion and misunderstanding of the so-called bloody nailing. The author emphasizes that he always nails without exposing the fractured neck. He considers a directing apparatus superfluous and thinks that it endangers the asepsis. Two roentgen machines should always be used in the nailing because the duration of the operation will otherwise be prolonged and the sterility threatened. The author warns against spinal anesthesia. He practically always uses local anesthesia and combines evipan with it occasionally.

(VOGELER) BARBARA B. STIMSON, M.D.

Felsenreich, F.: Unstable Joints After Malleolar Fractures (Schlottergelenke nach Malleolarfrakturen) *Arch f orthop Chir*, 1936, 37, 149

In spite of appropriate treatment disability in the nature of instability, swelling, rheumatoid manifestations, persistent widening of the mortice, and pain may follow ankle fractures. Sometimes irregularities in the roentgenogram point to arthritis deformans as

a causative factor, for which treatment yields but little improvement. In other cases, non-union of the internal malleolus causes the same complaints. The investigations of Fritz show that: (1) unstable joints caused by disturbed mechanics can hide behind roentgenologically normal joints, (2) the ununited internal malleolus causes no disability if the talus is held firmly in the mortice of the ankle, and (3) internal pseudarthrosis occurs after a certain type of fracture of the internal malleolus. Non-union of the internal malleolus is more frequent than has hitherto been believed. Unstable joints occur after poor reduction, the use of too loose splints, and after insufficiently frequent roentgenographic check-up, but especially if the first roentgenograms are not made in the maximum displaced position. Internal pseudarthroses are frequently overlooked on account of oblique fracture lines. Besides this fracture process, lateral and rotation displacements are given as the causes of the non-union. Insufficient pressure is another factor. In overweight people an osteosynthesis should be considered. In the after-treatment more is yet to be done through improved exercise treatment, especially for the avoidance of the frequently contracted flat foot.

BARBARA B. STIMSON, M.D.

SURGERY OF THE BLOOD AND LYMPH SYSTEMS

BLOOD VESSELS

Stapelmohr S von Varices (Ueber Varicen)
Svensk Läkartidn 1936 pp 96r 1015

Following a general discussion of tumors and varices and their treatment, the author turns his attention to their anatomy and pathology

With regard to their development the following theories have been presented

1 Varices are a mechanical change due to an insufficiency of the valves of the large saphenous vein (Delbet)

2 Primary varices originate in the deep veins (Verneuil)

3 Varices are due to the transmission of the arterial pulsations to the veins (Hasebroeck)

4 They are the result of congenital or acquired weakness of the venous walls of a non inflammatory nature (Bier) or the result of weakness of the venous walls of an inflammatory nature (Fischer)

5 They are the result of a weakness of the nervous tonus of the venous walls (Kashimura)

6 They may be regarded as a tumor formation inas (the nature of an angioma (Lesser)

teristically, they develop almost exclusively in the human notes nineteen are found chiefly in the lower extremities literature to which lower abdomen and in the plexus

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Further complications are infiltration of the lower leg over the varicose veins In these cases the skin becomes red or cyanotic In the hardened subcutaneous tissues the veins may be felt as distinct depressions Varicose ulcers develop as a result of trophic disturbances which frequently follow retrograde embolism or thrombosis From 80 to 90 per cent of all ulcers of the leg are caused by varices The ulcers occur chiefly in the area where the large saphenous vein branches into the subfascial venous plexus since at this place the retrograde backflow is most pronounced and varices are most apt to develop The so called venous fistula ulcer of the internal malleolus frequently develops with extreme rapidity it is small but very painful Another complication of varices is periostitis of the tibia and fibula its cause is still a matter of discussion In these cases also, the question of trophic disturbances from poor circulatory conditions is of the greatest importance from the etiological standpoint The author does not attribute any importance to the so-called over exertion periostitis Varicose periostitis may develop to such an extent that an interosseous callus forms between the tibia and fibula Finally a not uncommon complication is rupture of the venous vein either externally or subcutaneously

The treatment of varicose complications demands a very exact diagnosis It must first be determined if deep thrombosis is present Phlebotic ulcers should not be treated in the same manner as varicose ulcers In the former obliteration therapy which in general use for varicose ulcers must be used only with the greatest caution The differential diagnosis must exclude lues tuberculosis erythema induratum malignant tumors and diabetes In ulcer of the lower leg the Wassermann test should always be given

There are three methods of treatment the conservative operative and injection therapy For medical treatment there are numerous preparations of doubtful value Compression dressings are generally useful The best of these is the tricot stocking which is well and should contain as little rubber as possible The use of dressings of zinc and lime is also of value Small forms of conservative treatment of operative procedures is the ligation of the large saphenous vein and its numerous modifications Other methods are used to provide the saphenous vein with a new blood supply There are also operations on the trunk of neurotomy of the saphenous vein and sympathectomy for the purpose of preventing contraction The operation for varicose ulcers consists of a Thiersch graft followed by excision of the ulcer and the underlying tissue down to the periosteum The generally used method is injection therapy The author now uses exclusively a 5 gr

solution composed of 65 per cent dextrose. In addition to a good preparation for injection, the following requirements must be observed:

- 1 The thrombotic process must remain localized to the varix
- 2 The primary thrombosis must adhere so firmly to the wall of the vein that it cannot be torn loose
- 3 The danger of secondary superimposed thrombosis must be excluded
- 4 The indications and contra-indications for treatment must be determined exactly
- 5 Recurrences must be prevented
- 6 The preparation to be injected must be harmless to the patient
- 7 The pain of injection must be insignificant and transient
- 8 The treatment must be ambulatory and not interfere with the patient's work

The author discusses these requirements in detail. He suggests that combined operative and injection therapy when properly done may produce good results (HAAGEN) JOHN W BRENNAN, M D

BLOOD, TRANSFUSION

Lewisohn, R.: Twenty Years' Experience with the Citrate Method of Blood Transfusion. *Ann Surg*, 1937, 105 602

The author expresses gratification that the citrate method of blood transfusion has gradually overcome all the strenuous opposition which it encountered in its earlier years. Although this method has long been proved absolutely harmless, a note of warning is sounded against its indiscriminate use without definite indication. Chills have been found to be due to foreign protein reactions or to defects in the distillation of water. Careful cleansing of instruments, tubing, and glassware immediately after the transfusion is essential, and the use of triple distilled water is important. In the Mount Sinai Hospital, since the establishment of the special department for the proper preparation of instruments and solutions used for intravenous therapy, posttransfusion chills have been reduced from 12 per cent in 1930 to 1.2 per cent in from October, 1931, to October, 1932. In 1935 the incidence of chills was kept on the same low level. Three cases of aplastic anemia in which chills after blood transfusion were relatively frequent, apparently due to the underlying condition, were not included in the report of 1935. One patient had 4 chills in 31 transfusions, another had 8 chills in 18 transfusions, and the third patient received 12 transfusions without a chill. The slow-drop infusion which safeguards against a sudden overloading of the circulatory system is considered a most important addition to the technique of blood transfusion.

On the surgical service most of the transfusions are given during the postoperative course in connection with the intravenous administration of glucose solution. In practically every major abdominal operation the author starts the intravenous glucose

infusion as soon as the patient reaches the operating room. The patient is returned to the ward with the infusion apparatus in place. Whenever blood transfusion is indicated the glucose solution in the glass container is replaced by citrated blood. When the desired quantity of blood has been given, the intravenous administration of glucose is continued.

WALTER H NADLER, M D

Gohrbandt, E.: The Effect of Pectin on Blood Coagulation (Die Einwirkung der Pektine auf die Blutgerinnung) *Deutsche med Wchschr*, 1936, 2 1625

Gohrbandt reports further experiences with 400 patients. Contrary to Riesser in his experiments on rabbits, the author believes that sanjostop should be given prophylactically and therapeutically in all diseases with delayed coagulation, including liver disturbances. On the day before operation, from 20 to 40 c cm. were given intramuscularly, and on the day of operation, 20 c cm. The effect lasted for six days. The coagulation was then studied again and, if necessary, more sanjostop was given, by mouth if desired. When given orally it acted in from thirty to forty-five minutes, whereas after intramuscular injection it acted in ten minutes. The dose by mouth was 10 c cm. of a 3 to 5 per cent solution. There was no increased danger of thrombosis. Good results in hemophilia were obtained by Sack in 3 cases, and by the author in 2.

(FRANZ) LEO M ZIMMERMAN, M D

LYMPH GLANDS AND LYMPHATIC VESSELS

Rouvière, H, and Valette, G.: Regeneration of Lymphatic Glands and Reestablishment of the Interrupted Circulation in Lymphatic Vessels (De la régénération des ganglions lymphatiques et du rétablissement de la circulation interrompue dans une voie lymphatique). *Ann d'anat path*, 1937, 14 79

Rouvière and Valette note that the question of the regeneration of lymphatic glands has been discussed considerably recently. Most of the investigators have come to the conclusion that when a gland is completely removed, there is no formation of a new gland in its place.

The authors' own experiments were carried out on rabbits. The popliteal gland of one side was removed. This gland was chosen because it is a single gland which is easily removed and because the existence of a supernumerary gland in this region is extremely rare. An injection of methylene blue was made into the subcutaneous tissue of the toes before the gland was removed, and it showed definitely that there was no other lymph gland in the popliteal space in any of the fifty rabbits used for the experiment. The animals were examined from ten days to three months after the operation, forty of them more than a month after operation. In no case was there any sign of a lymph gland in the popliteal space. The authors conclude, therefore, that a

lymph gland does not form again after it is completely removed

In another group of experiments on rabbits a section of varying size was resected from a popliteal lymph gland and the efferent lymphatic was sectioned about 2 mm. from its point of origin in the gland. In six of fifteen animals used in these experiments the resected gland showed a considerable increase in size from one half to two thirds and sometimes even three fourths of its original size. In five cases there was an increase in size but not to the extent of one half of the original size. In four animals no trace of a lymph gland was found in the popliteal space. Cases in which most of the gland had been resected showed marked regeneration.

The amount of regeneration also seemed to be proportional to the number and size of the afferent lymphatics of the gland, but in no instance was regeneration complete even when there was no diversion of the lymph stream to some other route. The authors found that while other glands and organs may take over some of the function of a single gland the presence of a gland such as the popliteal is necessary for the mechanical regulation of the lymphatic circulation in the region where it is situated; therefore, it regenerates if the lymphatic circulation is not diverted to other routes. The efferent vessels of the partially resected gland are reconstituted in two ways: the terminal portion of one of the afferent vessels may serve for a retrograde flow of lymph to one of the collecting channels or

the terminal portion of an afferent vessel may form an anastomosis either with some neighboring lymphatic or with the remnant of the original efferent lymphatic.

In studying the lymphatic circulation in the animals in which one popliteal gland had been removed completely with or without ligation of the afferent and efferent lymphatics the authors found that this circulation was always reestablished. Different processes were responsible.

The vessels by which the circulation was reestablished and diverted were largely preexisting lymphatic vessels and capillaries which dilated and became adapted to a more active circulation. The vessels were single or multiple and showed marked variability in their arrangement and site. The vessels, however, were not alone responsible for the reestablishment of the lymphatic circulation. There was definite evidence of a new formation of lymphatics. Not only did these new vessels form at the site of the operation in cicatricial tissue but also in the neighboring normal tissue. In such tissue in which the lymphatic circulation was being reestablished some of the lymphatic capillaries ended in a cul de sac. Microscopic examination showed cells which are characteristic for a growing lymphatic vessel at the base of this cul de sac and in the network of the lymphatics it could be seen that such masses of cells advanced toward each other and united until a new vessel was formed.

ALICE M. MYERS

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE, POSTOPERATIVE TREATMENT

McIndoe, A. H.: *The Applications of Cavity Grafting Surgery*, 1937, 1 535

The most important basic principle in the reconstructive surgery of superficial skin defects is the diagnosis of the amount of epithelium lost and its successful replacement by a covering which can adapt itself to its new surroundings anatomically, functionally, and esthetically as much as possible. The simplest method of replacement is by means of a free skin graft applied directly to the denuded area after suitable excision of the granulomatous tissue and scar. If the graft is properly applied, a complete take results in a very high percentage of cases, which shows the essential vitality of epithelium under very adverse surroundings.

Many defects involve body cavities, such as the mouth, nose, orbit, or ear, with loss of lining skin and mucous membrane, and present problems of replacement crucial to the success of any repair. The essential modification of the Esser method of lining cavities with skin consisted in the introduction of the skin graft directly into the mouth, where it was found to take in an apparently septic cavity and in the presence of salivary secretion.

Certain precautions must be observed if the finished repair is to endure without contraction. The subcutaneous cavity must be made somewhat larger than the ultimate size required, it must be overdistracted with a block of modeling compound accurately molded to the size of the cavity, the mold must be entirely covered by a Thiersch graft so that a complete take can be expected without breaks in the continuity, and the cavity must be maintained distracted by the original mold for a period well beyond the normal contractile phase of grafted skin. It is most important that this overdistraction be carried out for a period varying from six weeks to four months, otherwise even in the presence of a perfect take, serious contraction will occur. Ill effects do not follow if a mold is buried under such conditions for long periods, provided some small drain hole is left for the escape of secretions during the healing phase.

The mouth represents the most important field for cavity grafting. The conditions in which an epithelial inlay is required in the mouth are:

- 1 Destruction of the buccal sulci due to disease. This is usually the result of specific or tuberculous ulceration.

- 2 Loss of buccal epithelium with resultant external deformity. This is caused by injury and can be cured only when the internal adhesions are freed. As a rule, the adhesions can be taken care of by adjustment of the mucous membrane flaps, but extensive losses will require grafting. The most frequent

use for intrabuccal grafting after injury is after larger bone grafts are made to the fractured lower jaw. Side-to-side apposition of the bone graft obliterates the sulcus for such a distance that a stable denture cannot be fitted.

- 3 After extraction of the teeth in elderly people. Occasionally so much bony absorption takes place in the lower alveolus that the buccal sulcus is too shallow to fit a stable denture.

- 4 Secondary cleft-lip and cleft-palate and in retrognathism. The repair of congenital deformities affords the most fruitful field for cavity grafting. In most patients, in whom secondary operations for cleft-lip are necessary, the upper buccal sulcus must be deepened in order to free the short, tight, adherent, and retracted upper lip, and to bring it forward in apposition with lower lip. In retrognathism a most satisfactory compromise can be effected simply by means of a large buccal inlay, the soft tissue of the chin being brought forward into excellent position and maintained there by a vulcanite extension of the lower denture.

As a preliminary to cavity grafting in the mouth and nose, it is necessary to work in cooperation with a dentist skilled in the making of splints and prosthetic appliances. When the preliminary dental work is completed, the lip is separated from the anterior surface of the maxilla or mandible as extensively as is required. An accurate and easily removable mold of Stent's dental compound is then made of the cavity in such a way that the retaining tray attached to the splint presses it firmly into place and overdistracts the cavity. A one-piece Thiersch graft is cut as thinly as possible and applied, raw surface outward, to the mold. The mold and its surrounding graft are then placed in position in the cavity, and the tray fixed on. The immediate after-care is simple and consists of keeping the mouth clean. At the end of seven days, the tray and the mold are removed. The cavity is examined and, as a rule, will be found well grafted with possibly one or two tiny spots unhealed. The mold is replaced. For the next three or four weeks the cavity is carefully cleaned and, if necessary, the mold is renewed, preferably with one made of gutta percha. When the graft is sound, the dental surgeon can fit the permanent denture with an extension on the vulcanite plate to occupy the buccal sulcus to its full depth.

In the upper lip exactly the same technique is followed.

A condition which is extremely difficult to treat by any other method is stenosis of one or both nares. An inlay on a stent mold containing a central hole through which the patient may breathe produces excellent results, but again it is necessary to persist with constant dilation throughout the period of the contractile phase of the graft. However, the most important field for the use of cavity grafting of the

nose is unquestionably in specific disease or congenital absence of the septum and supporting structures and in the deformity called dish face which follows severe telescoping fractures of the nasal ethmoid maxillary compound

A common condition after extirpation of the orbit is contraction of the socket to the extent that an artificial shell cannot be fitted or retained. Mucous membrane grafts for this condition are totally inadequate and they are difficult to apply. A simple and very satisfactory application of the epithelial inlay will solve the problem.

Traumatic stenosis of the external auditory meatus can be taken care of by gravity. An occasional use for cavity grafting in the ear is the condition of congenital absence of the external ear and external auditory meatus in which there is strong evidence x ray or otherwise that the middle ear ossicles and cochlea remain.

One of the most difficult conditions to treat is complete obliteration of the oronasal space due to specific disease or to tonsillectomy. The extent of the stenosis is usually so widespread that manipulation of flaps fails to create a passage from the pharynx to the nose. The complete absence of nasal drainage produces a septic condition of all the accessory sinuses and makes the condition of the patient miserable. After boring a hole between the adherent palate and the posterior pharyngeal wall from the pharynx into the nasal cavity, and inlaying skin on a mold retained by double silk threads tied round the columella and retained in place for at least two or three months, an excellent passage can be made. Drainage of the nasal cavity and sinuses is secured with remarkable improvement in the general health of the patient.

Utilizing the inlay principle two methods are available for the relief of hypospadias.

1. The open method. At one operation the penis is split ventrally, the remains of the corpus spongiosum are removed, and an inlay graft is spread on a large sized catheter which is placed in a groove along the whole length of the lengthened penis and brought out at the glans anteriorly and at the perineum posteriorly. The graft is well oversewn and the entire organ is bandaged in a mastisol case to obtain the necessary pressure.

2. The closed method. This is used after straightening has been accomplished at a preliminary operation by Edmunds' method. The difficulty of applying this method is the mechanical one of passing a skin covered catheter along a tunnel 2 or 3 in. in length without rucking the skin off the catheter and leaving raw areas ungrafted. This is avoided by the use of a special introducer.

The paper is well illustrated with photographs and drawings. LOUIS T. BYARS, M.D.

Shipley A. M. Disruption of Abdominal Wounds. An Unsolved Problem. *Surgery* 1937 1: 517.

The author reports two cases of wound disruption following a right rectus incision. In neither case was

there any evidence of infection of the peritoneal cavity or of the incision. In both instances cholecystectomy was performed. Careful examination of the wound edges from the skin to the peritoneum failed to reveal any catgut except two knots which were lying free and these were in the late stages of disintegration.

The writer emphasizes the importance of wound disruption, and reviews a number of papers that appeared on the subject in the last few years.

He states that in the early years of his experience he used the silk technique but with the advent of better catgut he began to utilize the latter. He believes that there is no difference in the two suture materials from the standpoint of wound disruption.

He divides wound disruption into cases with infection and clean cases. It is in the latter group that considerable anxiety is caused.

The author concludes with the hope that very careful attention to the subject will solve the problem. JOHN R. GARLOCK, M.D.

Shambaugh P. and Dunphy J. E. Postoperative Wound Infections and the Use of Silk. An Experimental Study. *Surgery* 1937 1: 39.

Controlled experimental studies on dogs show that operative wounds repaired with silk tolerate bacterial contamination better than similar wounds repaired with catgut.

The healing of experimental suppurating wounds is not delayed appreciably by the presence of b. f. d. silk sutures and ligatures provided that the silk used is of a fine grade, the sutures are cut close to the knot and no continuous sutures are employed.

Experimental suppurating wounds repaired with fine silk may heal completely without the removal or spontaneous discharge of the sutures.

SAMUEL KAZD, M.D.

ANTISEPTIC SURGERY. TREATMENT OF WOUNDS AND INFECTIONS

Babcock W. W. Wounds and Their Complications. *Am J Surg* 1937 36: 3.

The treatment of the various types of incised, contused and infected wounds is notoriously poor in a large percentage of our hospitals as well as in private practice.

Contused closed wounds with or without fracture are characterized by tissues so bruised and devitalized as to be subject especially to necrosis and infection. A particular danger which may extinguish the limited residual life of the part is the tension resulting from hemorrhage and edema. If tension is prevented it seems that seem to be hopelessly damaged and thought to require amputation frequently recover in a surprising way with little evidence of infection or necrosis. Tension results chiefly from the restraining skin and fascia which in a severe crush or contusion should be divided freely in the axis of the limb on two sides if necessary. The divided skin and fascia will then separate widely.

If the sheaths of the muscles are tense also, they should be opened freely. Bleeding vessels should be ligated and fractures should be reduced without internal fixation or undue manipulation. A very copious wet dressing of warm 1:4000 bichloride of mercury on fluffed gauze surrounded by cellophane or a similar impermeable layer, and finally a heavy encasement in sterile cotton, held by a lightly applied supporting bandage, is used. Unless complications develop, the dressing should not be removed for three or four days.

Contused and lacerated wounds including open crushing injuries have the element of potential infection, the avoidance of which depends largely upon the first treatment. The surrounding skin should be aseptized, the wound flooded with 3½ per cent tincture of iodine, and mechanical sterilization of the wound carried out by excising with a very sharp scalpel all tissue that is devitalized or impregnated with dirt. Bone containing dirt should be removed with a sharp chisel, not by scraping. Vessels should be ligated with fine alloy steel wire as most other materials form a nidus for infection. Such wounds of the head and face, and most wounds of the neck and trunk should then be closed immediately and very accurately, without damage, with the fine, No. 35 or 36 gauge, annealed rustless steel wire. With a meticulous technique primary union with slight scarring is to be expected.

Infection with the bacillus welchii. The spores of the gas bacillus carried into the wound with minute particles of woolen clothing, intestinal discharges, or street dirt are not destroyed by permissible antiseptics, and cannot be removed by debridement. However, the gas bacillus and related organisms seem unable to start infection in a well vascularized living tissue. It is in devitalized muscle, or in muscles to which the blood supply has been arrested by the injury or by the secondary tension within the sheath that this organism colonizes, and causes a putrid form of gangrene with much gas and liquid exudate that spreads from muscle to muscle. A wound may contain many spores of the Welch bacillus and yet heal without reaction. Other pathogenic bacteria may likewise remain in a wound without harm, provided no semi-devitalized or dead tissue or blood clot is present.

Dependence should be placed early upon the wide opening of the limb and the removal of all devitalized soft tissue. Often, removal necessitates the excision of entire muscles which may be pale and firm as if cooked. For the advanced case with the patient delirious, nearly pulseless, and apparently moribund, a high guillotine amputation is at times life-saving.

Progressive repair, reduced toxemia, and rapid elimination of necrotic tissue are very much more important than high bactericidal action of antiseptics applied to the wound. A healing contaminated wound is preferable to a sterile dormant wound. Granulations grow rapidly under a weak wet dressing of bichloride of mercury, iodine, or even bromine.

Bromine in 1:3000 to 1:5000 strength has a special value for very fetid wounds.

Dakin's solution is not applicable in ordinary practice and should be used only when the wound is wide open. When it is injected into the wound under tension it produces necrosis. In the abdomen it dissolves the mesentery down to the blood vessels. It is essential that it be applied copiously every two hours following the very precise technique elaborated by Carrel.

For irritated wounds or when the skin is excoriated, liquor aluminii acetatis of the National Formulary, diluted to 1 to 4, is of value. For tissues of low vitality as in a diabetic or arteriosclerotic the mildest and least irritating antiseptics only should be used.

Catgut produces reactions which retard healing and favor infection. It is especially harmful in infected wounds and on mucous surfaces. When catgut is implanted in the skin it causes a red flare and a wheal in twenty-four hours which progresses so that at the end of a week there is a zone of reaction and necrosis about each strand. For this reason firm healing is delayed until the catgut has been absorbed and the local damage to the tissues from the catgut repaired. From silk there is only a slight redness at the end of a week; from rustless or alloy steel wire no flare or wheal appear even at the end of four months.

Infected wounds may be divided clinically into two great classes. In the first class operation is performed, in the second, the physician waits. In the first early operation cures; in the second, it kills. This applies not only to wounds, but also to peritonitis and other forms of infection. The first class are caused by organisms similar to the staphylococcus which forms an endotoxin and an exotoxin which act upon endothelium and produce thrombi in the blood and lymphatic vessels and plastic exudate on the serous surfaces. Infections caused by the staphylococcus, the pneumococcus, the bacillus pyocyaneus, and the gas bacillus are treated by early sterilization, incision, or debridement. Free drainage, no sutures, wire instead of catgut ligatures; warm, wet antiseptic dressings, and rest are important. For a few of these infections there is an antitoxin of some value.

The second class of infected wounds are caused by a group of pathogenic micro-organisms of which the streptococcus is a striking example. They do not, as a rule, produce thrombic and plastic exudative reactions and, therefore, tend toward early and wide diffusion through the blood and lymphatic channels. The exudate, as a rule, remains liquid, but often causes a marked edema with redness, swelling, and pseudofluctuation suggesting an abscess. Usually this exudate is spontaneously absorbed. The proper treatment is immediate absolute rest in bed. The lymphatic circulation should be reduced by keeping the extremity splinted, but not constricted. The wound should be covered with an antiseptic ointment, as unguentum oxidum flavum, or a wet dressing, and not handled, squeezed, incised, or disturbed.

To supply complement, a transfusion of 150 ccm to 200 ccm of typed blood should be given every third day until the temperature remains normal.

If the donor will permit the richly leucocytic blood of an immunotransfusion may be used. Fifty million killed typhoid bacilli are injected into the donor's blood stream with resulting chill, sweat and fever. Six or eight hours later, or at the height of the resulting leucocytosis the transfusion is made. Transfusion has a high mortality in infancy and many more babies have been killed than saved by the injection of blood.

In a case of virulent infection, especially of one of the infections found in the second class of wounds, gauze drains should not be removed before the ninth day or before they have loosened spontaneously.

Granulating wounds if large may epithelialize so slowly as to greatly retard convalescence. Skin grafts are often applied when a quicker and much better result could be obtained by sterilizing the granulatory surface with a 10 per cent solution of chloride of zinc blotting and excising the granulation tissue with a sharp knife and then liberating the adjacent skin which is slid over the defect and sutured. The area may be so large that skin grafting is desirable. Only autogenous grafts made from the same person will survive. The cosmetic result from small Thiersch or pinch grafts is very poor. Large Thiersch grafts split skin grafts or fitted and sutured full thickness grafts should be used especially on exposed portions of the body. To ensure a successful take the even compressure from rubber sponges incorporated in the dressings is important.

NORMAN C. BULLOCK, M.D.

Low M. B. Tannic Acid—Silver Nitrate Treatment of Burns in Children. *See England J Med* 1937 215 553

The author is impressed with the excellence of the tannic acid silver nitrate treatment of burns which was originally suggested by Bettman. At the Children's Hospital in Boston twelve successive cases of severe burns were so treated with no evidence of severe infection under the eschar at any time. In none of the cases did argyria develop. The author believes that anhydremia is the most important factor if not the sole cause of the toxemia of burns.

STANLEY J. SEIGER, M.D.

Gordon D. The Treatment of Boils and Carbuncles. *Am J Surg* 1937 35 107

The all important requisites in the treatment of a boil or carbuncle are (1) to promote liquefaction of the slough primarily, (2) to supply early drainage for the pus under pressure and maintain it as is indicated in any abscess, (3) to prevent the discharge from spreading the infection and to aid in increasing the local and systemic resistance.

Drainage by necrosis of overlying tissue can be aided by moist heat, keratolytic drugs such as salicylic acid ointment of from 1 to 5 per cent

strength or incision. Moist heat can be applied in the form of sterile compresses wet with hot bone acid or Thiersch's solution covered with cellophane to prevent evaporation. Solutions of saline or magnesium sulphate are condemned. One per cent salicylic acid in boric ointment is a soothing antiseptic ointment which should be used on the turgid skin surface to prevent folliculitis and additional boils or applied generously over an incised lesion beneath wet or dry dressings to prevent the coagulation of exudate which interferes with drainage.

When more energetic softening of the superimposed tissue is indicated to open an existing pustule, Klotz's formula of salicylic acid in the form of an emplastrum as given in Brewer's Text Book on Surgery, is most valuable. The author has used it for a great many years to afford drainage of small pustular lesions for protection against and treatment of folliculitis and to prevent an infection from spreading. This emplastrum offers the simplest and most efficient dressing for small single or multiple lesions. It is employed by melting a small amount on the point of a spatula over a flame, dropping this in the center of a small circular piece of adhesive plaster and flattening it while still melted. It is then allowed to cool to a dull luster to avoid causing a blister in which the pus will collect. This 'paster' is applied to the lesion after all the hair has been shaved with a sterile razor and after a cleansing with alcohol. To remove the paster the margin is grasped with sterile forceps and a small cotton ball soaked with benzine in another forceps is used to float it off. After removal the benzine is wiped off with alcohol or witch hazel which is more soothing. If the surface requires cleansing a little hydrogen peroxide or tincture of green soap followed by alcohol is used. If gentle pressure on the paster elicits tenderness after twenty-four hours it is changed for a new one otherwise it is left on for several days before removal, at which time the infection will have subsided. In case of a draining lesion it is changed daily or oftener if the drainage is enough to show at the margin. These pasters are continued changed as indicated and left on until the wound is healed by complete epithelialization.

Incision under a local anesthetic is reserved for those lesions which are not draining and are so deep as to preclude the use of emplasrum salicylate. Klotz or in which tension is associated with tender lymph nodes. Block anesthesia when possible is more desirable than infiltration. Freezing with an ethyl chloride spray is a poor form of local anesthetic. A piece of rubber dam for drainage is sufficient when aided by 2 per cent salicylic acid ointment to keep the wound open if it has been adequately incised at the right time. The slough will fall out on the dressing when it has separated.

The dangerous zone of the mid face between the external canthi of the eyes and the corners of the mouth is mentioned because of the danger of pyogenic infection causing cavernous sinus infection.

and thrombosis. The necessity of atraumatic procedures to avoid complication by injury to the small veins about the lesions which are thrombosed is emphasized. Unnecessary trauma is caused by ligation of the angular vein, since studies by Batson have shown that such a ligature does not prevent substances injected into the facial vein from being carried into the cavernous sinus by several other routes. Specifically, the patient is put to bed in the sitting position, and continuously moistened hot boric cotton dressings are kept in place with a piece of rubber dam tied around the ears. The lesion itself is first covered accurately by two layers of small squares of gauze impregnated with 5 per cent salicylic acid in boric ointment. The cotton and greased gauze is changed by the patient with the aid of a looking glass, and the moistening is effected with a medicine dropper from a solution in a pan on an electric plate upon the bedside table. After the slough has formed and has been gently removed, the cavity should be treated with 1 per cent salicylic ointment. The patient is allowed in the horizontal position after the slough is out. When multiple openings of a carbuncle demand connection, a blunt probe or an electrothermic knife covered with a 0.5 per cent solution of carbolic acid may be used for this purpose, care being taken to avoid injury of any tissues except those surrounded by a protective barrier.

For the small deep-seated boil in this region, hot moist compresses are used until the slough is completely liquefied. The area is then anesthetized and opened carefully with a sharp Von Graef eye knife. A small wound is made and a piece of spear-shaped rubber dam is introduced. Salicylic ointment is then used with hot moist dressings.

Furuncles of the nose and the external auditory canal are treated with boric-acid and salicylic-acid ointment. Furuncles of the neck are treated according to the outlined technique, but should be protected especially against irritation and reinfection caused by tight collars with a large soft bandage. For furunculosis of the axilla the author has devised a muslin garment to hold large soft dressings in place, which garment permits movement of the arm without local irritation. All contaminated garments should be disinfected with 1 per cent formalin solution.

In treating carbuncles one should not wait for liquefaction of the slough. Hot moist dressings are used until the site of the maximum necrosis is found in order to determine the type and extent of the incision. Early drainage relieves undue tension and prevents extension of the infection, it diminishes the destruction of the tissue and the period of convalescence. Diabetes calls for more complete and immediate eradication of the infection than otherwise. General anesthesia is preferable. The incision is determined by the amount of skin that can be saved but which at the same time will permit complete removal of all necrotic sub-cutaneous tissue or the relief of lateral tension by removal of a wedge-

shaped subcutaneous section of the surrounding infected region. The incision can be made with a cutting endothermic knife, and bleeders may be controlled with the coagulating current. Removal of a portion of the deep fascia facilitates vascularization and separation of the slough that remains. The wound is packed with moist gauze and kept wet with Carrel-tube technique. When the outer dressings are changed the next day the skin is covered with 1 per cent salicylic ointment. The adjacent areas are watched daily for induration and tenderness, which should gradually subside as the slough completely separates. After this, vaseline gauze packing may be used. When the granulations are level with the skin, boric ointment covered with flamed adhesive changed every two days will promote epithelialization. Large cavities should be treated with the Carrel method and skin should be grafted on them before an excess of scar tissue has formed beneath. Before discharge, the patient should be instructed how to care for any small follicular infection which might develop and to use all the prophylactic measures possible.

Iodine is never used in the treatment or preparation for operation as it is an irritant, hardens the skin surface, and permits infection to progress beneath it. Soap and water followed by ether is sufficient. Vaccines are occasionally an aid in very stubborn cases, but so far a specific vaccine is not known.

From the author's experience in the treatment of boils and carbuncles it has been learned that the following four facts are important: drainage, gentleness, cleanliness, and thoroughness.

MATRICE P. MEYERS, M.D.

Ayres, S., Jr., Anderson, N. P., and Foster, P. D.: *Dermatological versus Surgical Treatment of Carbuncles and Furuncles*. *J. Am. M. Ass.*, 1937, 108: 858.

Questionnaires were mailed to approximately 250 surgeons and an equal number of dermatologists in the United States and Canada in an effort to appraise the methods employed in the treatment of carbuncles and facial furuncles.

The information obtained may be stated briefly as follows:

The great majority of surgeons employ crucial incisions or cautery excision of carbuncles, whereas the great majority of dermatologists employ conservative methods, including X-irradiation, vaccination, bacteriophage treatment, and topical application.

The average duration of the surgical treatment of carbuncles is almost twice as long as the dermatological treatment.

The mortality from carbuncles is low in both groups, but it is more than three times as great with surgical than with dermatological treatment. The cosmetic results are infinitely superior after the conservative methods used by dermatologists than after radical surgical procedures. SAMUEL KAHN, M.D.

Yodh B B On the Treatment of Tetanus *Brit Med J* 1937, 7 855

Observations are made on the results of the treatment of 438 consecutive cases of tetanus admitted to the J J Hospital in Bombay from 1931 to 1935 inclusive. The total mortality of all consecutive cases except 15 that were discharged by request was 50.6 per cent and after excluding those that terminated fatally within twenty-four hours after admission it was 29.4 per cent. That the results compare somewhat unfavorably with those of a previous series of 220 cases is probably explained by the fact that several brands of sera had to be used in the present group while only one brand was used for the previous group.

The combined method of administration of the antitoxin intrathecally through the cisterna magna intravenously and intramuscularly has continued to be used in this series. The clinical fact that the intrathecal administration of serum through the cisterna magna along with the other routes controls the course of the disease better establishes the need for further study of the concentration of antitoxin in the blood serum after intrathecal injections. The routine use of paraldehyde *per rectum* is recommended in all cases as the most suitable sedative for hospital patients. WALTER H NADLER, M D

Minkenhof J E The Treatment of Erysipelas with Prontosil (*Die Erysipelbehandlung mit Prontosil*) *Nederl Tijdschr v Geneesk* 1936 p 5197

This report contains a review of the literature concerning the effect of prontosil in cases of experimental animals as well as human beings infected with streptococci. Prontosil is believed to be nearly a perfect specific against erysipelas; it reduces the duration and decreases the severity of the condition. However, it does not prevent complications. It is also effective in other streptococcal infections, especially in puerperal fever and in infected abortion. In cases of streptococcal sepsis it is useless; perhaps it may prevent this condition sometimes.

These conclusions are based on the results of the application of prontosil in 35 cases of erysipelas and their comparison with the results in 35 similar cases not treated with prontosil. A graphic presentation of the individual cases is given. It is clearly shown that prontosil given by mouth every three days in doses of 2.0, 1.5, 1.0 or 0.5 gm respectively promotes and hastens the cure of erysipelas; reduces the

fever and limits the spread of the inflammation. Apparently it tends to prevent a relapse. Prontosil treatment has not caused any disagreeable consequences.

(VAN GELDEREN) CLARENCE C REED M D

ANESTHESIA

Cordier D The Methods of Resuscitation after Accidents Due to Anesthetics (*Les moyens de ranimation dans les accidents de la narcose*) *Ann et anal* 1937 3 30

The mechanical methods of resuscitation that are used in respiratory and cardiac collapse from inhalation anesthesia are reviewed. These methods include artificial respiration, massage of the heart, traction on the tongue, and excitation of the carotid sinuses.

Artificial respiration may be carried out by insufflation with an appropriate apparatus or by means of pressure on the thorax. The former method with an apparatus such as the pulmotor was originally reported upon unfavorably by Cannon, Henderson, and Meltzer. It was believed to cause an undesirable increase in the venous pressure. This opinion has been changed by more recent studies made by Henderson, Heymans, and Tournade, and at present the insufflation method is believed to be the better.

Of the manual methods that of Silvester is the most efficient and practicable in the operating room. Mechanical devices designed to accomplish the same purpose are inconvenient and not without danger.

Massage of the heart, either direct through the abdominal or thoracic operative wound or indirect by compression of the thorax, has been proved effective experimentally when combined with artificial respiration.

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It has long been known that compression of the carotid region causes hyperpnea, but only recently, in 1927, Hering discovered the rôle of the carotid sinus in this reflex. Danielopolu and Proca have shown that by stimulating the carotid sinuses through the skin apnea due to chloroform can be combated.

ALBERT F DE GROOT M D

PHYSICO-CHEMICAL METHODS IN SURGERY

ROENTGENOLOGY

Meyer, F.: III Effects Due to Thorotrast (Schæden durch Thorotrast) 1936 Hamburg, Dissertation

The author first discusses the method of using thorotrast for the purpose of demonstrating the liver and the spleen. He then describes the numerous experiments which have been carried out with this preparation both in this country and in foreign countries. Thorotrast is a thoriumdioxide salt with 25 per cent thorium oxide. It is stored in the reticulum cells of the spleen, the Kupffer cells in the liver, and in the bone marrow, lungs, lymph nodes, adrenals, ovaries, placenta, vertebrae, and ribs.

The questions, as to whether, and in what manner, thorium is excreted, are still disputable. Thorotrast remains for years in the body and may cause latent injuries, which are attributable to its radio-activity. The assertions of various authors concerning the anatomical and biological injuries to the body are not uniform.

The author had the opportunity of observing in the clinic, at yearly intervals for a period of three and one half years, a thirty-eight-year-old woman in whom the spleen had been demonstrated by means of thorotrast. During these observations vomiting occurred frequently, and abdominal and back pains, especially in the region of the spleen, frequent infections, and, later, cardiac symptoms, together with pains in the liver region and anemia, were noted.

The author believes that injury due to the radio-activity of the thorotrast remaining in the body is quite possible, and recommends as Eppinger did in 1934 that thorotrast no longer be used in human beings.

(SIEGFRIED STELZER) HARPY A. SALZMANN, M.D.

Liberson, F.: The Value and Limitation of the Oblique View as Compared with the Ordinary Anteroposterior Exposure of the Shoulder. *Am J Roentgenol*, 1937, 37 498

Shoulder pains are relatively common but the causes for many of them remain obscure even with roentgen examination. The author discusses at length some of the factors which make accurate determination difficult or impossible. Anatomical peculiarities of the joint account for some of the roentgenological problems, and it is thought that some of these can be ascertained by making oblique views in addition to the ordinary anteroposterior exposures. The method of making these oblique views is described in detail and its advantages are illustrated diagrammatically.

The result of the study of 1,800 cases of pain in the shoulder-girdle in the ordinary and in the oblique views are tabulated according to the various lesions encountered and the relative advantages of the two

views in connection with those lesions. Five hundred and eighty-one of these cases showed local pathology on the roentgenograms, of these 281 revealed lesions in the bony parts and 300 in the soft parts. In connection with fracture of the greater tuberosity of the humerus it was found that the oblique view showed the pathological process better than the ordinary view in 37 per cent of the cases, and the process was seen only in the oblique view in 2.3 per cent of the cases.

The most frequent pathological process of the soft parts was subacromial bursitis. The oblique view showed the pathological process better than the ordinary view in 43.6 per cent of the cases. The oblique view showed the process exclusively in 11.8 per cent of all cases of subdeltoid bursitis.

In fractures of the clavicle and in acromioclavicular arthritis, the oblique view fell short of yielding the same positive findings as the ordinary view in 10 per cent of the cases.

The oblique view cannot be substituted for the ordinary view, but should be used as an accessory exposure because at times it is the only source of roentgen evidence for disease in the region of the shoulder girdle. This was found to be the case in 25 of 581 positive cases in the series.

ADOLPH HAPTING, M.D.

RADIUM

Evans, R. D.: Radium Poisoning. II. The Quantitative Determination of the Radium Content and Radium Elimination Rate of Living Persons. *Am J Roentgenol*, 1937, 37 368

As is known, radium disintegrates spontaneously into a radio-active gas, so-called radon or radium emanation, which in turn disintegrates through eight additional stages into a non-radio-active form of lead. At one of these stages Radium C, which emits gamma radiation, is formed. In case of radium poisoning the radium present in the living body reveals itself in two independent ways: (1) as exhaled radon, forming in chronic cases about 45 per cent of the emanation produced by the total amount of radium stored in the body; and (2) as retained radon, forming the remainder.

The exhaled radon is evaluated electroscopically on the expired air. A representative sample of breath at the patient's normal respiration rate is collected in an all glass container under the necessary precautions and the radon measured by means of the ionization current produced in an ionization chamber by the alpha rays from the radon.

The retained radon is evaluated by the gamma rays of Radium C with the use of a new gamma-ray quantum counter, designed by the author, which is from ten to one hundred times as sensitive as the best electroscope. This instrument permits the

Yodh B B On the Treatment of Tetanus Brit
M J 1937 1 835

Observations are made on the results of the treatment of 438 consecutive cases of tetanus admitted to the J J Hospital in Bombay from 1931 to 1935 inclusive. The total mortality of all consecutive cases except 15 that were discharged by request was 50.6 per cent, and after excluding those that terminated fatally within twenty-four hours after admission it was 29.4 per cent. That the results compare somewhat unfavorably with those of a previous series of 229 cases is probably explained by the fact that several brands of sera had to be used in the present group while only one brand was used for the previous group.

The combined method of administration of the antitoxin intrathecally through the cisterna magna intravenously and intramuscularly has continued to be used in this series. The clinical fact that the intrathecal administration of serum through the cisterna magna along with the other routes controls the course of the disease better establishes the need for further study of the concentration of antitoxin in the blood serum after intrathecal injections. The routine use of paraldehyde *per rectum* is recommended in all cases as the most suitable sedative for hospital patients. WALTER H NADLER M D

Minkenhof J E The Treatment of Erysipelas with Prontosil (Die Erysipelbehandlung mit Prontosil) Nederl Tydschr v Geneesk 1936 p 597

This report contains a review of the literature concerning the effect of prontosil in cases of experimental animals as well as human beings infected with streptococci. Prontosil is believed to be nearly a perfect specific against erysipelas; it reduces the duration and decreases the severity of the condition. However, it does not prevent complications. It is also effective in other streptomyces, especially in puerperal fever and in infected abortion. In cases of streptococci sepsis it is useless, perhaps it may prevent this condition sometimes.

These conclusions are based on the results of the application of prontosil in 35 cases of erysipelas and their comparison with the results in 35 similar cases not treated with prontosil. A graphic presentation of the individual cases is given. It is clearly shown that prontosil given by mouth every three days in doses of 2.0 1.5 1.0 or 0.5 gm respectively promotes and hastens the cure of erysipelas; reduces the

fever and limits the spread of the inflammation. Apparently it tends to prevent a relapse. Prontosil treatment has not caused any disagreeable consequences.

(VAN GELDEREN) CLARENCE C REED M D

ANESTHESIA

Cordier D The Methods of Resuscitation after Accidents Due to Anesthetics (Les moyens de ramuscitation dans les accidents de la narcose) Anesth et anal., 1937 3 30

The mechanical methods of resuscitation that are used in respiratory and cardiac collapse from inhalation anesthesia are reviewed. These methods include artificial respiration, massage of the heart, traction on the tongue and excitation of the carotid sinuses.

Artificial respiration may be carried out by insufflation with an appropriate apparatus or by means of pressure on the thorax. The former method with an apparatus such as the pulmotor was originally reported upon unfavorably by Cannon, Henderson and Meltzer. It was believed to cause an undesirable increase in the venous pressure. This opinion has been changed by more recent studies made by Henderson, Heymans and Tournade and at present the insufflation method is believed to be the better.

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ALBERT F DE GROOT M D

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Miller, I. D.: Observations on the Influence of Movement on Surgical Shock. *Australian & New Zealand J Surg*, 1937, 6 296

By means of blood-pressure records made during operation as the position of the patients was being changed on the operating table, and as they were being moved from operating table to stretcher, and from stretcher to bed, the author determined that sudden movement often caused a marked fall in the blood pressure of individuals suffering from surgical shock. For example, the sudden collapse of the patient toward the close of an abdominoperineal resection of the rectum when he is turned on his side is well known. This stage of the operation is quickly over and the patient, having had no time to recover from the effects of the first movement, is again turned, placed upon a stretcher, taken back to the ward, and again lifted onto the bed. It is not surprising that such patients commonly go into a state of profound collapse. The same holds true for patients undergoing prolonged neurosurgical procedures, which are particularly liable to be exhausting.

The author demonstrates by means of blood-pressure tracings that if unnecessary movements are avoided and all necessary movements are performed slowly, serious manifestations of shock are much less likely to appear. He emphasizes that the patient should be left on the operating table for several hours, if necessary, after the conclusion of the operation if symptoms of shock are present. In order to avoid unnecessary handling, stretchers should not be used, the patient should be transported to and from the operating room in his own bed.

Recently this procedure was modified by the author who now uses a mobile stretcher which functions as an operating table and as a bed for as long a period as necessary. In this way all postoperative transferring of patients from the operating table to the stretcher and the bed is avoided.

ARTHUR S W TOUROFF, M D.

Boghlo, L.: Studies on the Pathology of Fat Tissue (Studi sulla patologia del tessuto grassoso) *Arch ital di chir*, 1936, 44 433

Boghlo discusses the conditions described under the terms liponecrosis, traumatic fat necrosis, lipophagic granuloma, fat necrosis of the breast, sclerema of the newborn, hard edema, vaselinoma, and others. He concludes that different terms, inexact in regard to the disease, its cause, and clinical characteristics, have been used for the same lesion, and that clinically and anatomically dissimilar conditions have been grouped together. He presents a critical revision of the subject to clarify the nomen-

clature and bring out particularly the participation of fat tissue in inflammatory processes, and the fundamental importance of the endogenous proliferation of the fat cells, called Flemming's proliferative atrophy, in various lesions of fat. A tentative classification of lesions of fat tissue based on the type of disease is given. All the afore-mentioned and similar conditions may be included in the following groups:

I Primary necrosis of fat tissue. This group may be subdivided into (a) pancreatic and intra-abdominal necrosis which is due to the direct action of pancreatic lipase, (b) focal necrosis involving the subcutaneous fat, but presumably not dependent on pancreatic lipase (this type is described under various names and is due to diverse causes), and (c) primary necrosis of fat which occurs in other regions.

The microscopic characteristics of all varieties of primary fat necrosis are death of the cells at a very early stage, splitting and saponification of the neutral fats in the necrotic cells, and, except in the pancreatic type, a non-specific inflammatory reaction. The foci may be encapsulated, calcified, transformed into pseudocysts, or absorbed and cicatrized. Atrophy of the fat cells with proliferation may follow, especially in the breast, and such cases are generally called lipophagic granuloma because the spongy cells are interpreted as phagocytes.

Primary fat necrosis occurs in adults and the newborn. The disseminated subcutaneous type may resemble a systemic disease. All cases of primary necrosis should be called by that name and subdivided according to the location and cause.

II. Chronic primary non-specific inflammation of the cellular and fat tissues, cellulitis, accompanied by regressive phenomena in the fat. The intracellular fat may be split and saponified without causing death of the cells, or the cells may undergo atrophy with proliferation. The inflammatory process is primary and the changes in the fat occur late. The reparative inflammatory processes are often interpreted as true fat necrosis simply because the intracellular fat is split, whereas this may occur normally, although less conspicuously, in ordinary fat metabolism.

This type may occur at all ages in circumscribed or diffuse form, as the result of various causes or without apparent cause. Although the pathogenesis and sometimes the outcome differ from primary fat necrosis, the cause and clinical picture may be the same, especially in the breast. The differential diagnosis between primary and secondary necrosis cannot be made clinically, except in the pancreatic type. The chronic non-specific cellulitis, hard edema, due to repeated contusions, shows atrophy of the fat with proliferation accompanied by periarthritis, phlebitis, and neuritis.

quantitative detection of a small fraction of the 'fatal dose,' which is supposedly about 2 micrograms, on patients placed at a distance of one meter or more. This distance greatly simplifies the geometrical arrangements between the patient source and detector. The author enters at length into theoretical considerations giving a series of mathematical equations which may be used in various situations. By placing the patient in a circularly symmetrical position and using a suitable equation he is able to account for the summed effect of all the Radium C in the body. This method in contrast with all previous work completely compensates for the non uniform distribution of radium in the various parts of the skeleton. Furthermore the method takes care of the scattered gamma rays and internal absorption of the gamma rays by the body itself. In two cases of radium poisoning the Radium C content was carefully measured and found to be 8.5 and 9.7 micrograms respectively. The absolute calibrations on the two subjects although completely independent were in exact agreement with each other proving the validity of the method and its absolute results. To be truly sure Miss Rubenstein carried out an additional series of experiments with 10 micrograms of radium buried at several depths in a cylindrical water phantom and the accuracy was likewise completely verified.

By taking the distribution of the radium in the skeleton of these two patients as an approximate representation of chronic radium poisoning gamma ray measurements were made at eleven points near the patient in order to expedite obtaining absolute measurements on other subjects. These calibrations are presented in the form of a table.

In addition to exhaling about 45 per cent of the radon produced by the radium of the body a victim of chronic radium poisoning eliminates about 0.005 per cent of the total body radium per day 61 per cent in the feces and 9 per cent in the urine. These quantities are readily measured by radium analyses of the feces and urine by the emanation method.

Simple gamma ray examinations of patients will detect chronic radium poisoning five or ten years before any clinical symptoms appear.

T LELAND MD

MISCELLANEOUS

Kohlrusch W. *Massage Therapy of Sports Injuries* (Massagetherapie von Sportschaden). *Therap d Gegenw* 1937 77 424

As sequelæ of sports injuries the author describes 2 muscle conditions occurring in the vicinity of injured joints. One consists of firm nodules ranging in size from that of a pea to that of a hazelnut and the other of increased tension in large parts of the muscle. The latter responds to pressure with a still further reflex tension and is less hard than the

nodules. If these conditions remain untreated they persist and on palpation after several weeks are found practically unchanged. Under the application of fine vibratory movements of the hand and in narcosis the tensions disappear but the nodules do not. On voluntary tension the degree of tension is increased as in normal muscle. In cases of nodules the increase of tension is weaker. Prolonged pressure on the nodules gives rise to sharp pain the same pressure over the hard areas causes dull pain. The author calls the nodules "myogeloses" and the tensions hard tension which was Mueller's term. As a general rule the two conditions are found together.

According to the author a experience injuries to the motor apparatus are followed in a few days by increased tension over wide areas of the surrounding muscles. If healing does not take place promptly a nodular hardness develops in the area of hard tension. The gelosis therefore arises on the basis of the hypertonus the increased tension. Attention is called to the fact that the pain is often falsely projected.

These conditions occur most frequently after injuries to the knee. When they are due to such injuries long hypertonic bands are found in the semimembranosus and semitendinosus or thin bands in the vastus medialis muscle.

The treatment consists of gymnastics in the form of contraction against great resistances followed by extreme stretching or relaxation. Myogeloses are common in tennis players and a myogelosis of the psoas is frequent in javelin throwers and oarsmen. When the latter occurs on the right side it may be confused with appendicitis.

The mode of action of gymnastics and massage cannot be definitely stated. The usual explanation the production of hyperemia is not sufficient. Other factors are the mechanical movement of fibers which otherwise would remain immobile movement of the interstitial lymph and the elimination of toxins. Swellings of the connective tissue as well as of the muscles can be reduced by massage. Exercise of the joints the most natural and best measure should be diligently practiced but not until the causes which gave rise to the connective tissue thickening have been removed. Too early exercise of the joints often renders the condition worse. According to Gebhardt the time to start exercise of the joints is when the muscles cease to tremble when put to use.

The author emphasizes that among the pathological conditions resulting from sports injuries muscle conditions are in the front rank. Massage and therapeutic gymnastics in the form of vibratory movements which exert a loosening influence and forceful contractions and extensions are the best means of guarding against late sequelæ.

(VOGELER) FLORENCE A CARPENTER

In another minute hyperemia sets in and soon becomes maximal. The speed with which hyperemia sets in and its intensity are an indication of the status of the local arterial supply. When hyperemia becomes maximal, the hyperemic spot is compressed with the finger tip for five seconds. Pressure is then quickly removed and the time necessary for the reappearance of maximal hyperemia is recorded with a stop watch. Under normal conditions with the extremity in the horizontal position, refilling takes place in from one to two seconds. If the arterial supply is poor, it may take from ten to twenty seconds, or longer. Care must be taken to have both the involved leg and the normal leg in the horizontal position when readings are made, for purposes of comparison. Under normal conditions, edema begins to appear in the frozen spots after from ten to fifteen minutes. At the same time, the hyperemia begins to disappear and the swollen spots become more or less pale and raised. When the circulation is impaired, the reaction is proportionately delayed and less marked.

The author recommends that amputation be performed at a point from ten to fifteen cm above the lowest spot at which there is a good response to the test.

ARTHUR S W TOUTOFF, M D

Helwig, F. C.: The Relative Importance of Histological Analysis in Tumor Therapy. *Am J Roentgenol*, 1937, 37 358

Although the histological picture is not sufficient to govern the management of each specific tumor growth, in certain common neoplasms gross and microscopic study alone ordinarily permits of outlining fairly accurately the growth rate, metastatic proclivities, and irradiation response. Variations resulting in peculiar and unusual occurrences are common, so that consideration must be given to many factors other than histology before any campaign of treatment is started or the results of treatment are judged. For purposes of illustrating some of the usual as well as certain unusual features of tumors and their response to treatment, a small series of common and a few relatively uncommon new growths belonging to different groups are analyzed.

Among the tumors arising from squamous epithelium, the common spindle-form type of basal-cell epithelioma is usually readily curable by almost any recognized method of attack. It is quite sensitive to irradiation and follows in all respects the somewhat uncertain law: the more primitive a cell, the more radiosensitive it is. However, when bone or cartilage is invaded such a tumor often becomes quite radioresistant, and if it shows adenocystic histological changes it becomes more resistant. Epitheliomas of the basosquamous type, which may be grossly indistinguishable from the ordinary basal-cell variety, require practically the same dosage of radiation as the squamous-cell malignancies of the skin. Topographic relationships are often of great importance, for instance, epidermoid malignancies of the mouth and tongue are relatively radioresistant,

whereas transitional cell epitheliomas which occur in the nasopharynx and oropharynx have been shown to be very sensitive. The lympho-epitheliomas and even some of the more adult types of squamous-cell malignancies when located in these regions are also often radiosensitive.

Similarly, analytical studies based on histological examinations have been made in connection with cavernous hemangioma of the skin, lymphangioma, melanoblastoma, malignant tumor of the ovaries, kidney neoplasm, prostatic and testicular tumors, carcinoma of the thyroid gland, carcinoma of the adrenal gland, tumor of the brain, and bone tumor. Numerous other malignant conditions are discussed relative to their radiosensitivity. The response to irradiation of metastases in relation to that of the primary tumor is briefly discussed in connection with certain malignancies. ANOLPH HARTUNG, M.D.

Bergstrand, H.: Multiple Glomic Tumors. *Am J Cancer*, 1937, 29 470

In 1924 Masson described a peculiar form of tumor which he called a glomic tumor. These tumors are usually localized in the nail bed, but they are described also as occurring in the skin of the extremities and of the coccygeal region. Usually they lie below the epidermis in the deeper layers of the skin. Clinically they are characterized by more or less severe pain which occurs in sudden transient attacks and is frequently occasioned by pressure on the tumor or exposure to changes of temperature, especially cold. In a number of instances it has been possible to demonstrate some disturbance of the sympathetic nervous system in the extremity harboring the tumor. Temperatures, higher or lower than normal, and hyperhidrosis have been found.

The author described two cases of multiple glomic tumors localized in the posterior lateral part of the foot, in the malleolar region. In one case six tumors were observed. One of these lay deeply within the adipose tissue in the sinus tarsi. In the second case there was a subcutaneous tumor and tumors in the calcaneus, talus, cuboid bone, and the fifth metatarsal bone.

The two cases were interesting in several respects. The tumors were localized in the same region, which fact was all the more remarkable as one of the two cases of multiple glomic tumors mentioned in the literature was of a similar nature. It would seem almost as if there were a clinical entity characterized by multiple glomic tumors localized in the posterior lateral part of the foot and the malleolar region. The second of the cases was unique in that an intraosseous localization of glomic tumors has not hitherto been observed.

JOSEPH K. NARAT, M.D.

Stout, A. P.: Solitary Cutaneous and Subcutaneous Leiomyoma. *Am J Cancer*, 1937, 29 435

During the past three years a very general interest has arisen, especially in the United States, in tumors of the neuromyo-arterial glomus. These are small growths characterized clinically by severe pain,

The vasculomas and similar growths probably belong to this group. The fatty content of the cysts and granulomatous foci found in many of them may be derived not from the material injected, but from the necrotic fat cells. It is the result of the so called endogenous transformation of organic fats into vaseline oil. The histology of these growths is very similar to that of primary fat necrosis or cellulitis with atrophy of fat tissue and proliferation.

III Hemorrhage into fat. In these cases presenting pseudocysts containing blood and detritus, atrophy of the fat with proliferation is also found.

Bogliolo discusses the origin of the spongy cells found in the lesions of fat tissue and concludes that they are not of endothelial origin but are derived from the endogenous proliferation of atrophic fat cells. They are also similar to embryonic fat cells. The cells which are considered to be lipophages are in reality spongy cells.

The discussion is augmented by illustrations from the literature and the author's own experience and is accompanied by photomicrographs, colored plates and a bibliography. M. E. MOSE, M.D.

Albright F, Butler A, M. Hampton A O and Smith P. A Syndrome Characterized by Osteitis Fibrosa Disseminata, Areas of Pigmentation and Endocrine Dysfunction with Precocious Puberty in Females. *New England J Med* 1937 216 727.

The authors report five cases of a syndrome characterized by (1) bone lesions which have a marked tendency to be unilateral and which show osteitis fibrosa on histological examination (2) brown non-elevated pigmented areas of the skin which tend to be on the same side as the bone lesions (3) an endocrine dysfunction which in females is associated with precocious puberty.

The skeletal abnormalities are spotty in distribution and consist of multiple localized areas of rarefaction in otherwise normal bone. The bone lesions tend to be unilateral and in almost all cases are regional, i.e. confined to one digit or one extremity. There is no general decalcification as is seen in hyperparathyroidism. One of the most frequently noted individual lesions is an area of rarefaction simulating a cyst. These cysts vary in size, shape and density. They may be present in both the medulla and cortex of the long and flat bones. Areas of increased density, circumscribed and either homogeneous or granular are frequently found. These areas of increased density may be at times in the cysts themselves. The involved bones may be markedly expanded. Periosteal changes occur rarely. The epiphyses often escape involvement when the entire remainder of the shaft is affected. Precocious bone age and early union of the epiphyses are part of the syndrome. In the skull the bones most commonly involved are those in the base and the superior portions of the orbital and frontal bones. The serum calcium and inorganic phosphorus values are within normal limits and the excretion of urinary calcium

is not increased. These findings dispel any doubt as to the connection of the syndrome with hyperparathyroidism.

Pigmentation, which is one of the cardinal features of the disease, is patchy and the individual patches tend to remain on one side of the midline. They occur most frequently over the sacrum, buttocks and upper spine. The amount of pigmentation varies roughly with the degree of involvement of the skeleton. When the bone disease is unilateral or almost unilateral the pigmentation tends to be unilateral or almost so and occurs on the same side as the bone disease. This distribution of the cutaneous and osseous lesions suggests an embryological or neurological disturbance.

The disease in the female is attended by precocious puberty with early union of the epiphyses. In the male cases puberty apparently comes on at about the normal time with less marked, if any precocity. These facts suggest that this part of the syndrome is due to a disturbance in the follicle stimulating hormone of the anterior lobe of the pituitary gland.

ARTHUR S. W. TOUROFF, M.D.

Nystrom G. A Method of Testing the Superficial Blood Circulation for Considering the Indication and the Proper Level of Amputation. *Surgery* 1937 487.

To decide whether amputation of an extremity is indicated in cases of disturbances of the blood supply is often difficult. If the indication for amputation is clear, the correct level of amputation may be difficult to determine. The use of the blood pressure apparatus, arteriography, oscillography, and the recording of skin temperature have been aids in determining the proper level of amputation. However, all of these procedures show the blood supply under existing conditions and give no indication of the circulatory response which may occur in case of a larger demand on the blood supply. If an attempt is made to produce hyperemia in the diseased limb or at least in its integument, the resultant increased filling of the capillaries serves as an indication of the vitality of the part.

The author's method of producing hyperemia consists of freezing the skin with carbon dioxide snow. He believes this to be superior to other methods of producing hyperemia for two reasons: (1) it produces an irritation of the capillaries and small arteries of such intensity that it results in the greatest possible degree of hyperemia in that particular patient and (2) it utilizes the degree of another inflammatory reaction, i.e. exudation and its clinical effect, edema, as a second measure of the response of the tissues.

The carbon dioxide snow in the form of a thin rod is applied to the skin for three seconds at various points from 5 to 10 cm. apart at first distally and then upward. The identical procedure is carried out on the opposite limb as a control.

In normal conditions the frozen spots return to normal consistency and color in about one minute.

mentioned substance, anatomical factors that made descent difficult or impossible were present. However, pre-operative treatment with this substance caused definite stimulation of the genital growth, and seemed to make surgical procedures less difficult.

Operative procedures appear to be necessary in most cases of undescended testes, but in the present state of our knowledge, they should be preceded by from four to six months' treatment similar to that used by these authors. SAMUEL KAHN, M D.

EXPERIMENTAL SURGERY

Pepere, M : Experimental Researches on the Behavior of Arterial Pressure during Operations (Ricerche sperimentali sul comportamento della pressione arteriosa negli interventi chirurgici) *Arch ital di chir*, 1937, 45 57

Pepere reports a long series of experiments on rabbits, showing, first, the effects of various anesthetics on arterial pressure, and, second, the associated effects of different types of anesthesia and operations. He concludes that the pressure depends on the type of anesthesia, the site of operation, and the gravity of the procedure. Local anesthesia has the least effect on the pressure. All the other types cause hypotension, which may or may not be preceded by a short period of hypertension. Splanchnic and spinal anesthesia produce marked hypotension, ether and avertin, a moderate hypotension. Operations which have only a slight hypotensive effect under ether or avertin narcosis produce a decided hypotension under local anesthesia.

The operations most liable to cause hypotensive states are those on the abdominal viscera, particularly such viscera as have pedicles situated near large nerve centers. Laparotomy *per se* in any type of anesthesia does not affect the pressure. The same is true when purulent peritonitis or intestinal ob-

struction is present. Under local parietal anesthesia, handling or exteriorization of the loops causes sudden notable hypertension, due to pain. This is followed by a period of calm associated with hypotension, the degree of which depends on the amount of manipulation. Infiltration of the mesentery decreases, but does not abolish the changes. Changes do not occur under ether, splanchnic, or spinal anesthesia.

Under local parietal anesthesia, the pulling on organs having short fixed pedicles causes sudden, severe, and often prolonged hypotension. This is considerably decreased by infiltration of the mesentery. It is absent in narcosis and in spinal and splanchnic anesthesia.

Pelvic operations under any type of anesthesia cause only minimal changes in pressure unless there is displacement of the intestine or traction on the mesentery.

In operations on the pleural cavity and lung, the changes in the blood pressure are independent of the type of anesthesia. Pneumonectomy, even when accompanied by traction on the hilum, has no notable effect on the blood pressure during the operation, but it may be followed by a sudden, severe, and often fatal hypotension.

Under perfect anesthesia of any type, the manipulation of great vessels, such as the femoral and iliac, never causes changes of pressure.

Operations on bone and particularly disarticulations of large joints are followed by marked and prolonged hypotension.

Operations on the cranium under local anesthesia produce marked hypotension. At the beginning of trephination, the pressure falls suddenly and irregularly. When the dura is reached the pressure returns to normal and is not affected by procedures on the cerebrum. Under ether, these changes do not occur.

Kymographic tracings and a bibliography are given. M E MORSE, M D

often of a paroxysmal nature. It has been very generally agreed that they must be one form of the painful subcutaneous tubercle first so designated by William Wood of Edinburgh in 1812. This is not the only lesion which may be called a painful subcutaneous tubercle or tuberculum dolorosum as the continental writers named it; the other is the cutaneous or subcutaneous leiomyoma.

Fifteen cases of solitary leiomyoma are reported in 4 the tumor was cutaneous and in 11 subcutaneous. A review of the literature shows that previously at least 83 cases of solitary and 132 cases of multiple cutaneous and subcutaneous leiomyoma have been recorded. A complete bibliography of the case is appended.

The salient clinical features of the solitary tumors include a generally long duration and small size; peculiar distribution, especially on the extensor surfaces of the upper and lower extremities; the scrotum, labium majus, the nipple and areola, and the cheeks, and rarely elsewhere, and characteristic pain, often of a paroxysmal nature. This pain is probably associated with violent contractions of the new plastic smooth muscle according to observations made by a number of different reporters.

The cutaneous and subcutaneous leiomyoma is a small tumor varying usually from the size of a pea to that of a walnut and only occasionally growing larger. The tumor occurs with equal frequency in both sexes and may appear at any age, although it has developed after the twenty-ninth year in more than half of the cases. It is rounded and occasionally pedunculated. Unless fixed in the skin, it is freely movable. The overlying skin is colorless or has a reddish or bluish tint. The tumor is composed chiefly of smooth muscle derived from one or another of the smooth muscle structures in the area; involved it develops in two chief forms, one without and the other with peculiar vascular structures which are probably in the nature of veins.

The rarity of malignant cutaneous and subcutaneous leiomyoma is pointed out, and the effectiveness of surgical excision as the treatment of choice is stressed.

It is believed that these solitary tumors, contrary to the general impression, are as common as if not more common than the multiple cutaneous leiomyomas. A wider knowledge among clinicians of their existence and a more general use of differential fiber staining in pathological laboratories will lead to their more frequent recognition.

JOSEPH K. NARAT, M.D.

DUCTLESS GLANDS

EVANS, E. I., SZUREK, S. and KERN, R. Blood Chemistry of Surviving Parathyroidectomized Dogs. *Endocrinology* 1937 21: 374.

A low serum calcium and high serum inorganic phosphorus, which according to some workers should precipitate tetany in the parathyroidectomized dog, does not do so in parathyroidectomized dogs in

latent survival. After parathyroidectomy in the dog, the serum calcium and inorganic phosphorus may remain at tetany levels for at least nine months without returning to normal. There are no significant changes in the sodium, potassium, magnesium, and chloride contents after parathyroidectomy during the survival period.

The presence of accessory parathyroid tissue does not explain the survival of all parathyroidectomized dogs as parathyroidectomized dogs may survive for at least nine months with a low serum calcium and a high inorganic phosphorus. We are of the opinion that some neuromuscular adjustment in the animal allows bodily functions to go on apparently normally in the absence of tetany, even though abnormal calcium, phosphorus, and calcium-sodium-potassium ratios are found.

J. THORNWELL WITHERSPOO, M.D.

GRAMER, A. J., JR. The Evaluation of Hormone Therapy for Undescended Testes in Man. *Endocrinology* 1937 21: 230.

An attempt has been made to evaluate the use of hormone therapy for the correction of human cryptorchidism. A summary of the published case reports to date is given and 20 additional cases are presented which makes a total of 81 cases in the literature. An analysis of the results shows that complete descent of the testis was obtained in 71.6 per cent and partial descent in 16 per cent of the cases; therefore 87.6 per cent of the patients were benefited by this method of therapy. The evidence is sufficient to warrant the conclusion that hormone treatment is a valuable method of therapy for undescended testes. When surgical correction is indicated the results may be enhanced by hormone therapy as an adjunct. SAMUEL L. HART, M.D.

THOMPSON, W. O., BEVAN, A. D., HECKEL, N. J., MCCARTHY, E. R. and THOMPSON, P. K. The Treatment of Undescended Testes with Anterior Pituitary-Like Substance. *Endocrinology* 1937 21: 220.

The effects of treatment with the substance from the urine of pregnant women which is similar to the substance obtained from the anterior lobe of the pituitary gland have been observed in the cases of 18 boys from one and one-half to seventeen years of age with 21 undescended testes. In 8 instances the testes were intra-abdominal and in 13 inguinal. The dose of this substance varied but commonly was about 200 rat units three times a week for an average of five months.

Descent occurred in four patients (22 per cent). In all 4 the testis was in the inguinal canal before treatment and in 2 it could be pushed to the upper end of the scrotum. Descent occurred within one month in all 4 cases. In 1 of these 4 the testis returned to the inguinal canal when treatment was stopped.

In 7 other patients who were treated surgically after the prolonged administration of the afore-

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SEPTEMBER, 1937

International Abstract of Surgery

Supplementary to
Surgery, Gynecology and Obstetrics

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INTERNATIONAL ABSTRACT OF SURGERY

SEPTEMBER, 1937

COLLECTIVE REVIEW

MALIGNANCY OF THE FEMALE GENITALIA

A Review of the Literature for 1936

DANIEL G. MORTON, M.D., San Francisco, California

Part I

Pathological Physiology

Carcinoma of the Uterine Cervix

Carcinoma of the Cervical Stump

Fundal Carcinoma

CONSTITUTING as they do a considerable proportion of all malignant tumors, malignancies of the female genitalia occupy an important place in medicine. Efforts to unravel the complicated skein of etiology, to elucidate pathological evolution, and to evaluate the various methods of treatment continue unremittingly. It is the purpose of this review to present the fruits of these efforts as they are reflected in the medical literature for the year 1936. A large volume of material has been covered. A few articles may have been overlooked, and a few others omitted, or merely mentioned, because their contents duplicate information from other articles which has been reviewed in some detail. It is hoped that the necessary quotation of many names will not detract from the readability of the review.

Grouped together in the initial section of the review are a number of articles dealing with the pathological physiology of malignancy in general, and with genital malignancy in particular. The contents of these articles are necessarily somewhat dissociated. Following this are sections on cervical carcinoma, carcinoma of the uterine body, carcinoma of the ovaries (including special tumors like the granulosa-cell tumor and the arrhenoblastoma), carcinoma of the fallopian tubes, and car-

cinoma of the vulva and vagina. A section is then devoted to the rarer forms of genital malignancy, such as sarcomas and mesodermal mixed tumors. Finally, there is a short section on endometriosis. A subsection on the problems of radiation therapy, with particular reference to the morbidity and mortality, is included in the section on cervical carcinoma.

PATHOLOGICAL PHYSIOLOGY

The possible relationship between the growth of tumors and the endocrine system is receiving considerable attention. Working with a rat sarcoma developed by transplantation of an adenofibroma through varying environmental conditions, Emge and Murphy (77) investigated the influence on tumor growth of injections of growth hormone and of hypophysectomy. The growth hormone did not increase the growth propensities of two strains of the rat sarcoma. From this result, the authors deduce that the hypophysis ordinarily works at a speed which cannot be augmented. In a group of hypophysectomized animals in which the general body growth was stunted, the administration of growth hormone failed to bring the rate of tumor growth up to normal. Hypophysectomy itself caused a varying response in tumor growth. In some animals growth was retarded. These authors believe that the relation between tumor growth and the hypophysis is similar to that between somatic growth and the hypophysis. In other words, tumor cells are no more sensitive to hypophyseal influence than ordinary body cells.

Since the ovary occupies an important place in endocrine relationships, Nitta (211) attempted

Part II and the Bibliography will appear in the October issue

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mined the urea nitrogen, ammonia nitrogen, amino-acid nitrogen, uric-acid nitrogen, creatinin nitrogen, and the total phosphoric acid in the urine of patients with uterine cancer. These also were reduced in proportion to the degree of carcinomatous invasion. These changes signify a decrease in the decomposition and oxidation in the body of the patient with cancer. When the growths were sufficiently advanced to cause a disturbance in the liver function, there was a drop in the ratio of the urea-nitrogen to the total nitrogen, and an increase in the ratio of the ammonia nitrogen to the total nitrogen consistent with the explanation given above.

Fujita (99) found also that the total nitrogen was much greater after radical operation than in the controls. This he attributes to the increased proteolysis incident to traumatism, anemic necrosis, inflammation, and the accumulation and decomposition of secretions at the operative site. He (100) found similar increases in the urea nitrogen, ammonia nitrogen, amino-acid nitrogen, and the phosphoric acid of patients who had been operated upon. After roentgen radiation, this author (101) found that all of the nitrogenous elements had decreased. As more treatment was given, they gradually increased again.

Bowman and Pitts (26) made studies of the calcium and phosphorus content of the blood, as well as of the basal metabolic rate and the urinary pH, in 50 women with malignancy and 26 without. Average values are given, and show little variation. The authors conclude that there is no change in the calcium and phosphorus metabolism in malignancy that is not related to changes in the phosphorus content of the body fluids caused by malnutrition, cachexia, and chronic loss of albumin.

Hori and Esaki (146) describe their experiences in culturing *in vitro* cancer cells obtained from the cervix and invaded lymphatic glands. The latter gave the best results. The authors obtained positive results in 10 of 23 cases. After forty-eight hours the cells began to liquefy and degenerate. The cells are described.

Castro Stiel (37) describes the Botelho reaction for the diagnosis of cancer. The reaction depends upon the hypothesis that there are many cell remnants and cells with a high glycogen content in the blood of cancer patients which will react with iodine in a suitable solution. To the blood serum of the patient in question, nitric acid and then a special iodine solution is added. If the solution remains clear enough so that the filaments of an electric light bulb can be distinguished through it when the tube is held up to

the light, the reaction is negative. If the solution is so cloudy that the filaments cannot be distinguished, the reaction is positive and cancer is present. The exact technique of the test is given. A correct diagnosis was made in 90 per cent of 20 cases in which histological corroboration was possible. In 100 pregnant women, there were four positive tests.

Yazima (282) reports his investigation of the "indigestion" seen frequently in cases of uterine cancer, and its variations due to radiation. Twenty-two cases with inoperable growth were studied before and after radiation. Hypo-acidity was found more frequently than hyperacidity, but no characteristic curve could be established. The author thinks that intoxication due to cancer toxin is responsible for the disturbance in the gastric secretion, and conjectures that the acid-secreting ability of the gland cells is depressed. With improvement in the general health following radiation, the amount of secretion and its acidity increase. When the patients get worse, the amount of secretion and the acidity decrease again. The original variations in pepsin and chlorine were influenced only slightly or not at all by radiation.

Masson and Montgomery (190) report 13 cases of acanthosis nigricans. Five occurred in young people and 8 in adults. The authors comment upon the frequent association of this condition with abdominal malignancy. In four of the adult cases, an abdominal malignancy was present. Of 218 cases gathered from the literature, 10 were associated with pelvic malignancy, and 58 with stomach cancer. Acanthosis nigricans is associated with abdominal malignancy in from 75 to 80 per cent of the patients more than forty years old. Histologically the following changes may be noted: (1) relative and absolute hyperkeratosis, (2) marked irregular acanthosis, (3) the formation of narrow, elongated, papillary bodies, (4) dense melanin pigmentation of the basal cells of the epidermis, and (5) the occurrence of chromophores laden with pigment in the papillary bodies. Deep pigmentation of the axillae, neck, and external genitalia occurs in that order. Marked verrucous, papillomatous, and hyperkeratotic changes may occur. The cause of the condition is thought to be the pressure of the tumor upon the chromaffin system.

A short note by Lazarus-Barlow (170) extols the virtue of the Friedman test in the diagnosis and management of cases of hydatidiform mole and chorionepithelioma. Four cases are cited. A persistent positive test, an increasing one, or a recurrent one signify that living chorionic tissue

to study the effect of the female sex hormone on the growth of malignant tumors. Attention is first called to the varying results of others. Working with rat cancer and with rat sarcoma this author compared the rate of tumor growth in castrated females with that in non-castrated females. Both mature and immature animals were used. The rate of growth was definitely slower in the castrated animals although this was not as marked in the immature as in the mature animals. The apparent inhibition started almost at once and became intensified with time. The experiments were repeated, castration being effected only after the tumors had reached a certain size. The rate of growth in the castrated animals became slower almost at once. The effect of the injection of follicle hormone on the growth of transplanted tumors was also investigated. Both castrated and non-castrated animals were used. The tumor growth in the animals injected with follicle hormone was definitely inhibited. The effect was more marked in the castrated animals. No conclusions were drawn. Nitta thinks that secondary effects may play a part in the inhibition.

Diamant Berger (63) discusses the close relationship of folliculin and carcinogenic agents. He mentions that folliculin has been found in tar, a common carcinogenic agent, and wonders if the carcinogenic property of tar is due to its folliculin content. (The chemistry of these substances has since been worked out more exactly. The carcinogenic agent in tar, while closely related chemically to the female sex hormone and capable of producing estrus in animals is not identical with it.) Diamant Berger reports the case of a young woman who had received large doses of folliculin because of severe menopausal symptoms incident to operative ablation of the ovaries and later developed a carcinoma of the pancreas. He believes that the development of the cancer was due to the large doses of folliculin.

Kutcherenko and Issakhonov (165) also note the similarity of folliculin and carcinogenic agents. They studied the ovaries in 100 cases from the point of view of the possible association of ovarian activity and tumor growth. Fewer primordial follicles, but more proliferating and atretic follicles, were found in the cases in which tumors were present than in the controls. These authors wonder if an overproduction of Prolan A was responsible for these variations.

Novak and Yui (116) state that an association between hyperestrinism and endometrial hyperplasia has already been established. In their article which is reviewed in more detail in the

section on carcinoma of the uterine body, they attempt to show that endometrial hyperplasia may be a precursor of uterine adenocarcinoma. If the suggested sequence is correct, hyperestrinism may well be related to the formation of adenocarcinoma of the uterine body.

These articles express the trend of opinion that carcinogenesis and endocrine activity are related. It is clear, however, that specific relationships of particular hormones to tumor growth are far from being definitely established.

Somewhat different is the line of thought suggested by the cases exhibiting the association or sequence of different tumors in the same individual. The occurrence of truly different tumors of the genitalia in the same individual suggests the existence of a tumor diathesis. Occasionally, confusion may arise because the tumors may all be of one general type, e.g. adenocarcinoma. When this is the case the possibility of metastasis must be excluded. Usually, the cell picture makes this differentiation possible. Counsellor and Butsch (48) report two cases of double malignant tumors of the uterus. One case exhibited the coexistence of a squamous cell carcinoma of the cervix and an adenocarcinoma of the uterine body. The second case presented adenocarcinomas of both the cervix and the uterine body, the component cells of which were quite different. Yun (284) describes an interesting case in which carcinomas of the uterine fundus, the cervix, and the stomach, and an ovarian cyst developed at intervals of a few years. The carcinomas were all of the glandular type, but because of the difference in the cells the author thinks that each was a primary growth. Grieco (120) reports a case in which both cancer of the uterine body and bilateral ovarian fibromas were found and discusses the cause and pathogenesis. He believes that such occurrences are due to a blastomatous diathesis. A few other cases of multiple tumors in the same individual which were reported from different points of view are recorded in the appropriate sections.

Fujita (97) determined the daily quantity and the total nitrogen content of the urine excreted by patients with uterine carcinoma. Nineteen women with early carcinoma, 8 with marked carcinomatous invasion, 12 healthy women and 3 women with fibroids and ovarian cysts were studied. The quantity of urine and the total nitrogen were reduced in the women with carcinoma, the reduction being proportionate to the degree of invasion. The author regards these findings as evidences of disturbance in the general metabolism incident to cancer rather than the result of the cancer *per se*. Fujita (98) also deter-

ureteral obstruction. This study included 87 autopsy examinations, 79.3 per cent of which showed obstructions of this nature. The remainder of the findings were based upon pyelography, blood chemistry, and phenosulphonphthalein tests, and showed a high proportion of ureteral obstructions. These authors and Drexler believe that much can be done to relieve pain and discomfort by ureteral dilatation, nephrostomy, ureteroscopy, or nephrectomy, depending upon the circumstances, and therefore all cases should be studied urologically. The results of these reports support those of previous autopsy studies and emphasize especially the tremendous importance of parametrial spread.

Attempts to estimate the frequency with which metastasis occurs in the regional glands have often been made in the past. This pathological behavior of cervical carcinoma is of great significance in view of its bearing upon the prognosis. Pearson found local pelvic metastases in 59 per cent of the women dying of the disease. Taussig (264) has operated upon 46 borderline cases in Stage 2 and found the regional glands to be involved in 15. Schlunk and Chapman (243) found the glands to be involved in 19 (31.3 per cent) of 89 patients who were operated upon. Bonney (23) found the regional glands to be carcinomatous in 42 per cent of the cases which were operated. While the parametrial invasion is more likely to cause death, glandular invasion is important because it may prevent cure even when the local growth has responded to treatment. An interesting type of glandular invasion is that reported by both Gricouroff (119) and Michel-Béchet (199), in which the metastasis was glandular while the original growth was squamous-celled. Gricouroff notes the benign appearance of the deposits, and states that Wertheim's observations seem to confirm this idea. The latter observer found lymph nodes containing glandular inclusions in 48 of 500 operated cases. Wertheim believed that they had no connection with the cervical cancer, because of the subsequent course of these cases. Of 41 patients with true squamous-cell lymph-node involvement only 5 were alive after 5 years, while of 21 with glandular inclusions in the lymph nodes 18 were alive after 5 years. The inclusions have been attributed to Wolffian remnants, metaplasia of the lymphatic sinus endothelium, and endometriosis. Gricouroff favors the endometriosis theory.

Notes on special features of the local spread of cancer may be found in the reports of Eichenberg (76), and Guenschmann (124). The former

describes six cases in which the cancer spread superficially to the vaginal mucosa. The possible modes of spread are described. Spread may occur by the superficial growth of the cancer from the borders of the cervical lesion, through the medium of outrunners invading the subepithelial lymphatics, in which case the mucosa may remain intact; or by direct invasion of the deeper connective tissue. When the vagina has been invaded, treatment by radiation is difficult because of the danger of producing a fistula. Radical operation is recommended if the parametrium remains uninvolved. Guenschmann points out that the bladder is invaded by cervical cancer rather infrequently. When the bladder is involved it is usually by means of lymphatic spread. This author describes the invasion of the bladder base and the trigone, and the results of submucosal spread. The latter type of spread is manifested by up-raising of the mucosa with hemorrhage, bullous edema, ulceration, and necrosis. These changes may eventuate in fistulas.

By far the largest number of cervical carcinomas are composed of epidermoid or squamous cells and probably arise at the junction of the squamous and columnar cell linings. A small percentage arise within the canal itself and are made up of columnar cells. These are ordinarily designated as *adenocarcinomas*. Leroux and Millot (175) distinguish carcinomas arising in the cervical canal from those of exocervical origin, and describe a number of histological types of the former. Of 1,511 uterine cancers 84 (5 per cent) were endocervical in origin. These 84 are divided into four broad histological groups. The first group includes all cancers, the predominant cell of which is cylindrical or columnar, these cancers are subdivided into vegetative and canalicular cancers, and those without architecture. The second group is termed malpighian cancer. These tumors differ from squamous cancer of exocervical origin in that the malpighian cells surround the glands which retain their shapes and columnar cell linings. The third group is called undifferentiated cancer. The component cells are midway between malpighian and cylindrical cells, and manifest characteristics of each type. The fourth group includes complex epitheliomas in which glandular elements border epidermoid elements. Clinically, these authors were unable to differentiate between cylindrical and squamous-cell growths. These growths are of slow local evolution, like corpus cancer, they are slow to metastasize; and usually appear as surface vegetation. From the point of view of radiation therapy the authors believe that cylindrical-cell cancers

is still present. A positive test with highly diluted urine often confirms a diagnosis of hydatiform mole or chorionepithelioma. Not many moles become malignant, but when one does, it is naturally important that the fact be known as soon as possible. Repeated Friedman tests furnish a very useful and reliable means of determining this fact.

CARCINOMA OF THE UTERINE CERVIX

Etiology and Pathology. No very startling information regarding the etiology is available in the literature for the year 1936. The opinion that cervical lacerations and chronic cervicitis incident to childbearing play an important rôle is reflected by the statements of Findley (91, 9*), Jones (151), Schreiner and Wehr (250), Dickinson (69), Ulrich (271), and others. This opinion is based, of course, upon the fact that the majority of cases of cervical cancer are seen in women who have had children and upon the well known fact that chronic irritation predisposes to the development of cancer. In this connection Ulrich reports three cases of cervical cancer occurring in nulliparous women all of whom had been subjected to some form of operative trauma to the cervix years before. He wonders if previous operative trauma occasionally causes cancer.

Of considerable interest from the etiological standpoint are the metaplasias and hyperplasias of the cervical mucosa. Leucoplakia is a hyperplastic condition definitely considered by some to be precancerous. Hinselmann (139), Schiller (241) and Laffont, Montpellier and Laffargue (167) are of this opinion, as well as many others. The last three authors report Hinselmann's experience with six cases histologically verified as leucoplakia in 1926 four of which developed into cancer before 1930. These authors characterize leucoplakia as a condition which entails (1) complete epidermization of the mucous cells with the appearance of a stratum granulosum reproducing true epidermis (2) hyperacanthosis with penetration of the stroma by more or less irregular epithelial projections and (3) inflammatory reaction in the stroma. If this lesion is truly precancerous it is of tremendous clinical significance because it can be diagnosed by the use of the colposcope, the Schiller iodine test, or sometimes by naked eye examination. Laffont, Montpellier and Laffargue believe, however, that this lesion is frequently confused with metaplastic states of the cervix which are regressive and not likely to become malignant. These authors report at some length the varieties of the metaplastic and hyperplastic states of the cervix, making certain

artificial subdivisions which are rather difficult to follow in spite of the numerous microphotographs illustrating their descriptions. They believe that of the various epithelial alterations, hyperacanthosis is the most specifically precancerous. This report serves particularly to emphasize the benign character of the ordinary metaplasia or epidermization seen so frequently.

The report of Hisaw and Lendrum (143) on the effect of estrin administration in monkeys is worthy of mention because of the recent theories regarding the carcinogenic qualities of estrogenic substances. By prolonged estrin administration to monkeys the authors produced a condition of squamous metaplasia in the cervix which "resembled beginning malignancy in the human." This work confirmed the findings of Overholser and Allen and Engle and Smith. They were unable, however, to produce the metaplasia by stimulation of the animal's own ovaries by the administration of anterior pituitary preparations. They found further that progesterin administration inhibited the metaplasia formation. While experiments of this nature cannot as yet be translated into human terms, they may mean that investigators are at last working along promising lines.

The pathological evolution of cervical carcinoma is illustrated by a number of reports. It is well known that cervical cancer first tends to invade the adjacent mucous membrane of the vagina, gradually obliterating the fornices. When the growth bursts the bounds of the cervix it usually spreads laterally into the parametrium, either by direct invasion or through the lymphatics. Of course, it may occasionally metastasize to the neighboring lymph glands before much local spread has taken place. Spread to the uterine fundus, the bladder and the rectum are common late events. The blood stream is usually invaded late in the disease also, thus distant metastases are not common. The tendency toward parametrial invasion is well illustrated by Pearson's (220) report dealing with the factors causing death in cervical carcinoma. This author studied 57 consecutive cases in which autopsy examinations were performed. The most constant finding was stricture of the ureters due to parametrial invasion, with consequent hydro-nephrosis and hydro ureters, which occurred in 75 per cent of the cases. Both ureters were involved in 30 cases. Drexler (73) studied 27 consecutive autopsies upon women dying of cervical cancer. Ureteral obstruction and associated pathology were found in 22. Graves, Kichham and Nathanson (118) investigated 257 cases of cervical cancer from the point of view of

ureteral obstruction. This study included 87 autopsy examinations, 79.3 per cent of which showed obstructions of this nature. The remainder of the findings were based upon pyelography, blood chemistry, and phenosulphonphthalein tests, and showed a high proportion of ureteral obstructions. These authors and Drexler believe that much can be done to relieve pain and discomfort by ureteral dilatation, nephrostomy, ureterosotomy, or nephrectomy, depending upon the circumstances, and therefore all cases should be studied urologically. The results of these reports support those of previous autopsy studies and emphasize especially the tremendous importance of parametrial spread.

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carry no worse prognosis than others. In America the growths described are grouped together under the single heading *adenocarcinoma of the cervix*. In a collected series of 9509 cervical cancers, Norris (213) reports the incidence of adenocarcinoma to be 5.7 per cent. He agrees with the opinion stated previously that clinically cervical adenocarcinomas are indistinguishable from squamous-cell cancers. Norris describes a number of histological divisions revealed in the literature some of which fit in roughly with those of Leroux and Millot. Adenocarcinomas have also been divided by various authorities into ripe, partially ripe, and unripe forms, into highly differentiated and slightly differentiated forms, and into adenoma malignum and true adenocarcinoma forms. Norris believes that mitosis is the most important single index of the degree of malignancy, and is in agreement with Leroux and Millot that these growths are no less sensitive to radiation than squamous cell cancers. The details regarding age, symptoms, race and marital status are given in 43 cases. Four (12.9 per cent) of the 31 patients treated more than five years ago remain alive and well.

For a long time now efforts have been made to correlate the various histological forms of cancer with the degree of malignancy and radiosensitivity. Tumors composed of highly differentiated cells, that is those approaching the well developed adult form, have been considered of low malignancy and the most resistant to radiation. At the other end of the scale tumors consisting of cells which are only slightly differentiated, or approach the embryonic form, have been considered to be rapidly growing, highly malignant, and the most susceptible to radiation. If these concepts were correct they would naturally be of tremendous value in the determination of the treatment and prognosis. Articles bearing on this question were published in 1946 by Norris (212), Hausding (129), Proust and Parat (228), Aver (9), Medolska (196) and Ossinskaja (218). It is hardly necessary to give the details of each. All of the authors believe that it is practically impossible to correlate cellular differentiation and radiosensitivity. Norris lists the important factors bearing directly or indirectly on this relationship such as the size and shape of the neoplasm, its blood supply, the general condition of the patient, the fact that the histological picture may vary from microscopic field to microscopic field, and the fact that the histological make up may change. When one takes these factors into consideration it is amply clear that it is possible for morphologically similar growths to vary markedly in response to radiation. Various comparisons are

made by Norris and by Hausding in attempts to correlate radiosensitivity with anaplasia. The results are far from conclusive. Both of these observers believe, however, that the mitosis content has some significance, that those growths containing large numbers of mitoses are the most sensitive. Norris found almost twice as many mitoses per 100 oil immersion fields in a group of 66 patients with Stage 3 cervical cancers who survived for five years, as in an equally large group of patients with Stage 1 cervical cancers who died within one year of treatment. Proust and Parat believe that the picture in the basal or germinative layers is of much greater significance than that seen in the more superficial layers. Wambersky (275) attempts unsuccessfully to analyze factors such as the age of the patient, her age at the menarche and at the menopause from the point of view of prognosis. Ossinskaja (218) found in five cases that the histological picture of the recurrence sometimes showed a greater and sometimes a lesser degree of differentiation than that of the parent tumor.

Wohlwill (180) reports his investigation of the stroma in 100 cases of cervical carcinoma. The character of the cellular infiltration and the reticular substance varied markedly. All kinds of inflammatory cells were found. The admixture sometimes represented a true granulation tissue. Sometimes one type of cell predominated. In one case lymphocytes predominated to such an extent that the picture of typical lymphatic tissue presented. The author points out that it would be easy to mistake such a picture for a mixed tumor composed of coexistent carcinoma and lymphosarcoma. Relationships between specific carcinoma forms and specific stromal reactions could not be established. In the light of this work Wohlwill concludes that his original belief that different kinds of stromal reactions reflect differences in the prognosis is no longer tenable. Scipades (241) studied the elastic tissue elements in cancerous cervixes and found that there is a partial or total disappearance of these elements proportionate to the amount of accompanying inflammatory reaction.

Strauss (258) reports a case of cervical carcinoma in a seventy-six year old woman with uterine prolapse. He comments upon the rarity of this condition and states that probably not over 70 cases have been noted in the literature. Cureleanu (50) reports a case of coexistent cervical carcinoma and a dermoid cyst of the left ovary. This is an extremely rare association. Cervical carcinoma exists in conjunction with ovarian cysts in general in about two per cent of the cases,

and with dermoids about 33 times less often. Cureleanu takes occasion to comment upon the difficulties in diagnosis presented by such cases and discusses the possible association of the upset endocrine equilibrium provoked by the appearance of a dermoid with the appearance of the cervical cancer.

While cervical carcinoma is typically a disease of the premenopausal and menopausal eras, it occasionally occurs in much younger women. Neill (210) reports 86 cases in women younger than 30 years from the Kelly Hospital in Baltimore. Thirty were operable and 56 were inoperable. Of the 30 operable patients 17 were operated upon with no five-year survivals, and 13 were radiated with 4 five-year cures. Neill concludes that the prognosis in young women is particularly bad. Ludwig (181) reports a case of cervical carcinoma in a girl of sixteen. He states that the literature contains 6 cases occurring in children from six months to sixteen years of age, and 7 cases in girls from sixteen to twenty years old.

The coincidence of carcinoma of the cervix and pregnancy is a rather rare one. Baer (10) puts the incidence at 1 in 10,000 pregnancies and Amico-Roxas (5) noted 2 such cases in a series of 452 cervical cancers. The latter author reports the 2 cases. The first was treated with radium, followed two months later by cesarean section and supravaginal hysterectomy. The child weighed 2,800 gm and was in good condition. Seven years later the mother was still alive and well. The second patient was treated with radium in divided doses, and then delivered vaginally five weeks later. No serious complications were encountered. More radium was given three weeks after the delivery. Five months later both mother and child were alive and well. Amico-Roxas recommends radium in small amounts with fractionated doses. Roentgen-ray treatment should be avoided as there is more chance of harming the fetus. Fagioli (82) reports his treatment of cervical carcinoma in pregnancy. Baer points out that cancer grows much faster when it occurs in the pregnant woman, presumably because of the increased blood supply. Added to the ordinary dangers of cancer are the hazards of infection and hemorrhage at the time of delivery. Baer also believes in radiation therapy with radium, but says that radiation in early pregnancy kills the fetus and after the period of viability produces a large proportion of fetal defects. His treatment varies with the stage of the pregnancy. If early, the pregnancy is disregarded. If the pregnancy is from four to seven months old, minimal radiation is given until the

child is viable, at which time a Porro cesarean section is performed, which is followed by complete radiation. If the pregnancy is from seven to ten months old, operative removal of the child is followed by complete radiation. If the lesion is very advanced less effort is made to save the child. Baer believes that radium in small amounts does not harm the fetus if the head is 5 cm from the cervix. No results are reported.

A rather unusual case of a true cervical pregnancy which simulated a carcinoma is reported by Gheorghin and Protopescu-Pake (110). The authors believe that all such cases should be treated like malignancies.

Diagnosis Because the vast majority of cases of cervical cancer are advanced when first seen and because the results of treatment in these advanced cases are so poor, more and more attention is being directed toward prevention and early diagnosis. The problem is a difficult one because cervical cancer is so often relatively advanced by the time symptoms appear, and most women and some doctors do not appreciate the significance of intermenstrual bleeding and foul discharge. Martius (186) estimates that about 10 per cent of the cases become inoperable because of ignorance or delay on the part of the physician. Esch (79) states that 49 of 209 patients with cervical cancer arrived for treatment two months or more after the diagnosis had been made. However, as both Esch and Daniel and Movradin (57) bring out, when the doctor is at fault it is usually because of incomplete or superficial investigation, rather than error in diagnosis. This state of affairs cannot be blamed on the education that the physician receives because, as Berkeley (16) points out, all recognized medical schools teach that whenever the symptoms of intermenstrual bleeding, excessive menstruation, or foul, watery discharge present themselves singly or collectively, the patient should be examined vaginally both by palpation and inspection, and that if any doubt exists a biopsy should be taken. For this reason, so far as the physician is concerned, it is more a matter of conscientiousness than education. So far as women in general are concerned, the problem is one of education. This fact is emphasized by the three authors quoted, as well as by many others. Berkeley urges that the information regarding the signs and symptoms of cancer should be propagated by means of lectures, leaflets, and exhibitions. Although some authorities doubt the value of public education because of the possible creation of a cancerphobia, as Berkeley says, "It is better to be nervous than dead!" While the dangerous age

lies between thirty five and fifty years, Martius Esch, and Goldstine (113) point out that this disease may occur at almost any age. Of Esch's 329 patients 93 were under forty, and 15 were under thirty. Adair (1) recommends careful observation of women between thirty five and fifty-five years, and Martius believes that all women over thirty five should be examined periodically by means of palpation, the speculum, the colposcope, and biopsy if necessary. Adair details the common symptoms. He brings out that the bleeding is often confused with menstruation. Late in the disease there may be pain, bladder and rectal symptoms, edema due to uterine compression and the general symptoms of malaise, anorexia, and cachexia.

In the effort to make earlier diagnoses new methods of examination have been established. When the disease is well developed, ordinary inspection and palpation are usually sufficient. A friable, everting cauliflower mass which bleeds easily upon manipulation or a craterous ulcer with hard, irregular borders is very characteristic. Sometimes however there are no characteristic changes. The question then becomes how to diagnose the condition in its incipient stages. Conditions which lead to confusion are chronic cervicitis, erosions, ectropion, leucoplakia and cervical polyps. Indeed, Schiller (241) states that cancer exists in from one to two per cent of apparently normal cervixes. In order to help in the differentiation of the various conditions, two comparatively new methods of examination are being used widely; they are the colposcopic method developed by Hinselmann and the iodine test of Schiller. Hinselmann (139, 140, 141, 142) published four articles during 1936 in which he urges the use of his instrument. He cites one case of an incipient cancer found in a twenty-three year old girl by the observation of characteristic colposcopic changes. In a second article he cites three similar cases. Leip (171), Bucher (30), Linspach (178), Kranzfeld (162), Tschamer (270), McDevitt (192) and others agree that the systematic use of this instrument would bring many early growths to light. Kranzfeld points out however that much experience with this instrument is necessary to learn the normal variations. Whitish, leucoplakic patches are considered suspicious areas. When such exist, a biopsy is taken from these locations.

Schiller (241) describes in detail the development of the iodine test, its rationale and significance. The technique is as follows: the cervix is exposed by means of a speculum and cleaned off with cotton. Then a sufficient amount of a modified

Lugol's solution (iodine 1, potassium iodide 2, water 300) to cover the cervix and surrounding mucosa completely is poured into the vagina and left in contact for five minutes. The solution is then sopped up with cotton and the cervix observed for staining. Normally, the cervical mucosa stains a dark brown, or mahogany color. Unstained areas are regarded with suspicion. The rationale is that normal mucosal epithelial cells contain glycogen and therefore combine with the iodine solution to stain brown, whereas cancer cells do not contain glycogen and therefore fail to stain. Well defined white patches with distinct borders are considered characteristic. Unfortunately, staining also fails to take place whenever there is a loss of mucosa, e.g., an erosion. Under this circumstance, the unstained area is reddish, not white and not so well demarcated. Leucoplakic areas also fail to stain. Therefore while a failure to stain does not always mean cancer, a biopsy should be made of such areas. Schiller has carefully studied the histology of a number of such biopsies. He believes that this test enables him to diagnose malignant changes in the epithelium before the stage of invasion. He bases his contention that such areas are truly cancerous on the cellular changes, such as the presence of mitoses, irregularity of the cells, variation in the size of the cells, and variation in staining reactions. Schiller believes that in order for this test to be of much value, the cervixes of all women examined should be stained with iodine. While practically all of those writing on the subject of early diagnosis advise the use of Schiller's test, some are skeptical of its value. Goldstine (113) doubts its value and believes that biopsy of the suspicious looking cervix is the only reliable method of making a definite diagnosis.

The biopsy, of course, remains the court of last resort, but it is indeed true that the colposcope and the iodine test may point out areas for biopsy which would not otherwise be suspected. Dollf (72) reports that in 89 erosions which clinically were regarded as benign, biopsy revealed the presence of cancer in 4. This author believes that all erosions which remain unhealed fourteen days after treatment should be investigated by biopsy. The possibility that biopsy may be a dangerous procedure in itself has been discussed at some length in the past, as some believe that it might open up the lymphatics to the spread of cancer. The 1936 literature contains only a few comments on this point. Goldstine (113) and Dickenson (99) hold that there is little danger in this operation. While Berkeley (16) does not discuss the question in detail, he states that biopsy should

be performed only when the operator is prepared to institute treatment at once should cancer prove to be present

Masciottra and Martinez de Hoz (188) discuss in detail the differential diagnosis between tuberculosis and cancer of the cervix.

Findley (91, 92) believes that cancer never develops in a normal cervix. Apparently Jones (151) and Schreiner and Wehr (250) join him in the belief that disease and injury of the cervix are factors in the development of cancer. All of these authors agree, in some measure at least, that cervical cancer may be prevented by proper obstetrical and postpartum care, periodic examination, the treatment of erosions, repair of injured cervices, and cervical resection when proper response is not obtained to the simpler measures

The possibility of malignant changes in cervical polyps has been commented upon extensively in the past. The removal of such growths with microscopic study, especially of the pedicles, has come to be considered good practice. Of 91 cervical polyps investigated by Dolfi (72) only 1 proved to be malignant, 3 showed suspicious areas. Geiger (106) reports the findings in thirty-two polyps occurring in 2,048 gynecological cases. Malignant changes with invasion of the pedicle were found in 1 case. Fulconis (102) reports 1 case of cancer developing in a polyp, which resulted in serious hemorrhage

Operative Treatment. The treatment of cervical carcinoma most generally used is radiation. Operation is still employed by a few, but of course its applicability is limited by the comparatively small number of cases suitable for radical removal. Most of the series reported contain a few cases in which the radical operation has been performed. Bonney (23) reports his experiences with the Wertheim operation in 483 cases and describes the technique. These cases represented about 63 per cent of the entire number of cases seen. This is a much higher percentage of operable cases than is reported in the majority of the series, as may be seen by reference to the table of results given. This high percentage may be explained by the fact that Bonney is well known as a surgeon so that more early cases than the average clinic is likely to receive are referred to him. It is pointed out by Schmitz (246) that operation is suitable only for the most favorable cases. The only operative procedure permissible in the treatment of this disease is a radical one. There are two important methods, Wertheim's abdominal operation and the vaginal operation of Schauta. They both aim to remove the adnexa, the entire

uterus and cervix, the parametrial connective tissue, and at least the upper portion of the vagina, in one piece. In Wertheim's abdominal operation the regional lymph glands are also removed. Less radical operations have proved worthless. Gál (105) reports 233 uterine cancers treated by the vaginal operation with a primary mortality of 23 per cent. At the Muenster Frauenklinik Freisfeld (96) reports that the radical vaginal operation is employed for cases in Stage 1. This is followed with radium and roentgen-ray therapy. Mitra (202) employs the same operation for early cases because "Doederlein has demonstrated that cancer cells may remain alive (in the cervix) even after full radiation." Burckhardt (32) and Finlaison (93) also employ a radical operation for early cases. Todd's (269) collection indicates that a considerable number of authorities still believe in this method of treatment. Some employ the vaginal and some the abdominal operation. For inoperable cases radiation is employed. There is a considerable primary operative mortality for these radical procedures, variously reported from 2 to 20 per cent. Bonney reports a 14 per cent operative mortality. In writing on the complications of surgical treatment Schmitz (245) brings out the value of a careful selection of patients. The growth must be early, there should be no retention of material within the uterus, and the patient should be in good general condition as regards her blood pressure, urinary excretion, pulse rate, and blood count. As peritonitis is one of the major causes of mortality it is wise to investigate the bacterial flora of the cervix and vagina before operation. The Ruge-Phillips test is recommended for this purpose. If dangerous bacteria are present, operation should be delayed until the vagina can be sterilized. Shock, excessive blood loss, peritonitis, and pelvic cellulitis are complications not infrequently encountered. Dysfunctions of the bowel and bladder often result. Fistulas may occur. Shaw and Dougal (253) report that radical operation has been abandoned at the University of Manchester. These authors believe that equally good or better results can be obtained in the early cases by suitable radiation.

Taussig (264) advances the interesting thesis that an operation to remove the regional glands may be of value in borderline cases in which the local reaction of the cervix to radiation is good. This idea is based upon the knowledge that cure fails to result from radiation in many borderline cases, not because of recurrence in the cervix itself, but because the regional glands have already been invaded at the time of treatment

and are not accessible to radiation. He received encouragement for his idea in Bonney's report that 23 per cent of his patients with glandular metastases remained alive for more than five years after operation. Taussig's technique is as follows:

From 1,000 to 1,500 r are given over a period of two weeks, and two weeks later, lymphadenectomy of the iliac or hypogastric glands, parametrial glands, uterosacral glands, obturator glands, and the nodes situated over the iliac vessels at their exits from the peritoneal cavity is done. Two weeks after operation intra uterine radiation with 150 mgm of radium up to 4,000 or 5,000 mgm hr is given, and finally additional roentgen therapy of from 2,000 to 2,500 r. Taussig has now operated upon 46 cases in 15 (33 per cent) of which metastases were found. A comparison of the results after two and four years with the results in cases radiated only seems to indicate that removal of the glands was of distinct value. Duncan (75) suggests that to this operation be added the tying off of the uterine arteries, the removal of all fatty connective tissue with contained nodes, and the abdominal implantation of radon seeds into the lower uterine segment, the parametrium, and the uterosacral ligaments. For similar reasons, Michel-Bechet (199) has performed iliac lymphadenectomy through an extraperitoneal approach in thirteen cases. In six of these cases metastases were found. Brocq, Palmer and Parat (28) report a fresh operation in a case of columnar cell cancer of the cervix. Upon opening the abdomen they found that parametrial induration extended out to the iliac glands of both sides; the glands were densely adherent to the iliac veins. The entire uterus, cervix, vaginal vault, parametrium, iliac glands and short segments of both iliac veins were removed *en bloc*. The patient made a good recovery, remained free from recurrence for some months later, and complained only of transient edema of the lower extremities.

Radiation Therapy. Radiation therapy remains unstandardized. A great many variations in the technique of applying radium appear in the articles dealing with radiation therapy and results. McWhorter (195) considers the subject from a theoretical viewpoint and believes that the ordinary method of designating dosage as a number of milligram hours is unsatisfactory as it ignores the variables of distance, filtration and distribution. He believes that the r unit would have more meaning. He further points out that dose is without much meaning unless it refers to a lethal amount delivered to all portions

of a growth homogeneously. Most of the dosages reported vary from 4,000 to 8,000 mgm hr of radium, although some employ a small amount of radium over a long period of time and others a large amount over a short period of time, to arrive at the same number of milligram hours. Roentgen ray therapy with a high voltage machine (most approximate 200 kv), is combined with radium therapy by most. McWhorter expresses the belief of many that it is preferable to give the roentgen therapy first. The advantages of preliminary roentgen radiation are that it makes the cervix more movable and destroys the bulk of the growth, which effects make it easier to find the cervical canal when radium is inserted and allow the radium to act at a greater depth. Further advantages are that local sepsis is cleared up and time is given to improve the general condition of the patient. However, many other authorities give the radium first. Figures do not reflect the correct point of view, perhaps it is a matter of indifference. As a matter of fact, as Berkeley points out, roentgen therapy has yet to prove itself. This author thinks that it is of value. Its primary purpose is to destroy cancer in the regional glands and in those portions of the parametrium which are too far removed to be affected by radium in the cervix or vagina.

It would be tiresome and profitless to detail the many radium techniques described. They can be divided into several main classifications, somewhat as Todd (269) has done. The so-called Paris, or Regaud technique requires a small amount of radium from 70 to 80 mgm which is distributed in the cervical canal against the cervix in the formers for a long period of time. The radium is left in place for several days, long enough to give a dosage of from 7,000 to 8,000 mgm hr. The filtration is heavy, being from 1 to 1½ mm of platinum. The packing and radium are removed for vaginal cleansing once a day, then reinserted. The idea behind this method is that cancer cells are most susceptible to radiation when they are in mitosis and unless the radium is constantly present over a number of days the mitotic phase of man, cells would be missed. The results reported for this technique are tabulated. A second popular technique is that in use at the Radiumhemmet in Stockholm. This method requires a larger amount of radium which is distributed in the cervical canal and against the cervix and is left in place long enough to obtain a dose of 1,500 mgm hr at one sitting usually less than twenty-four hours. This procedure is repeated twice at weekly intervals. The total dose is usually about 4,500 mgm hr.

Occasionally the total dose is given in two sittings Todd designates as the "American" method the use of a very large amount of radium over a short period of time, such as Burnam employs. The reviewer does not believe, however, that one can designate this plan as American as a great variety of methods are used in this country and, so far as he is aware, very few institutions possess enough radium to duplicate Burnam's method Ward (276) inserts needles containing about 10 mgm of radium into the parametrium, others insert needles into the cervix itself. In a general way, the radiation methods in vogue involve the placing of radium throughout the cervico-uterine canal, against the cervix, and in the lateral vaginal fornices. The amounts of radium used vary from 60 mgm to from 150 to 200 mgm. The dosage arrived at varies from 4,000 to 8,000 mgm hr. In some methods the dosage is given at one sitting, and in others at several sittings, usually a week apart. The total number of hours during which the radium is in place varies, of course, with the amount of radium used. Boxes, plaques, tubes, and needles are employed to distribute the radium in the desired locations. The screening varies from 1 to 2 mm of lead, or its equivalent, to 2 mm of platinum. There is usually a secondary filter of rubber or aluminum. As indicated in the section on results there is not much difference in the final salvage, except that due to variance of the material. Articles dealing with the information given were published during 1936 by the following authors, in addition to those reporting results and those mentioned before: Van Damme (32), Bueben (31), Porter (225), Morrin (204), Findley (92), Montgomery (203), Kress and Reinhard (163), Bengolea (14), Bottaro (24), Plate (222), Bandujo (12).

Complications and mortality of radiation therapy
That radiation therapy is not without its morbidity and mortality is becoming increasingly apparent. Numerous reports deal with this subject. It is clear, however, that radiation *per se* is not entirely responsible, as some of the complications are due to the manipulation incident to placing the radium and others to the resolution of growth in a vulnerable location. This division of responsibility is of little consequence as the various factors are, indeed, a part of "radiation therapy." Reiles and Fobe (231) divide the complications into two groups, those due to the direct action of the radium, e.g., vesicovaginal and rectovaginal fistulas, cystitis, proctitis, and vaginal atresia, and those arising when pre-existing inflammation is stirred up by the radiation, such as, peritonitis, adnexitis, thrombophlebitis and

embolism, and septicemia. The former are usually due to improper technique, such as too large dosage, or insufficient screening, and are not as important as those due to infection. It is thought by many observers that the incidence of infectious complications can be reduced by instituting measures to combat the local infection and to build up the general health before radiation is begun. Such preliminary procedures as electrocoagulation of the growth, local applications of various dyes or of acetone, administration of autovaccines and preliminary x-radiation have been suggested as valuable measures. Guiler (125) believes that the damming back of secretions with a tampon at the time of inserting radium favors infectious complication. When he omitted the tampon, the incidence of morbidity and mortality decreased from 27 to 1 per cent. Anselmino and Oehlke (6) believe that fewer complications result when the fractionated dosage method is used, than when comparatively large quantities of radium are used over a short period of time. Bowing and Fricke (25) emphasize that radiation complications should be prevented rather than treated. They suggest that efforts be made to clean up the local cervical infection before radium is used. Transfusion may be necessary to build up the general condition of the patient. Matousk (191) recommends that douches be given for three days before radium therapy is instituted. In addition, in cases of fundal cancer he cures the uterus as a preliminary to insertion of the radium, and in cervical cancer he excochleates the cervix.

Major complications developed in 5.6 per cent of the 495 patients treated by Bowing and Fricke. These were practically all inflammatory and included the following: pelvic cellulitis, pyometritis, hydronephrosis, septicemia, general peritonitis, and pulmonary embolism. Of the 100 patients with cervical cancer treated by Reiles and Fobe, 49 had fever as a result of the radium treatment, and 9 experienced serious complications, namely, pelvic peritonitis in 6, one of which was associated with the perforation of a pyosalpinx into the rectum, adnexitis and parametritis in 1, serious hemorrhage due to the erosion of a vessel in 1, and embolism in 1. Anselmino and Oehlke report serious complications in 8.8 per cent of their cases, and minor complications in 24 per cent. The severe complications were parametritis in 14, septic thrombophlebitis in 4, thrombosis in 2, cystopyelitis in 2, Douglas abscess in 1, salpingitis in 1, hemorrhage in 1, and pyometra in 1. These reports furnish an adequate sample of the major inflammatory complications encountered.

Bowing and Fricke
Guilera (Regaud technique)

Reiles and Fobe (Regaud technique)
(Report mortalities of 10 authors
6.5 per cent)

Ward
Anselmino and Oehlke
Heukensfeldt Jansen
Chydenius (Stockholm technique)
Matousek (Regaud technique)

Variations—0.6 per cent to

1 2 per cent (6 of 495 cases)
2 7 per cent (8 of 29 cases with tamponade)
3 0 per cent (1 of 100 cases without tamponade)
4 0 per cent (4 of 100 cervical cancers)
5 5 per cent (3 of 14 fundal cancers Embolism)
6 0 per cent (1 of 100 metrorrhagias)
7 0 per cent
8 5 per cent (13 of 362 cases)
9 2 per cent (372 cases)
10 6 per cent (8 of 226 cases)
11 2 per cent (7 of 318 cases)

The most usual causes of death following radium therapy are peritonitis, sepsis, and embolism. Various other manifestations of infection may be responsible, such as pyelonephritis or pneumonia. Hemorrhage is an occasional cause. The mortalities reported are shown above.

A considerable amount of literature relative to the more remote consequences of radium therapy is accumulating. These remote consequences are those due to the specific action of the radium itself, in contrast to those of an inflammatory nature mentioned. Of these late complications, injuries to the rectum and bladder form the largest group. As brought out by Mickulicz Radecki (200) and Berkeley (16), it is often difficult to determine whether the lesion is due to radiation or to the continued invasion of the cancer, yet many lesions are definitely produced by the radiation. Reports of rectal injuries are lacking in the 1936 literature except for casual reference to a number of fistulas. Mickulicz Radecki estimates that from 4 to 5 per cent of the cases radiated later undergo bladder injury. In his opinion, the most important change is that produced in the blood vessels. This leads eventually to an ectasia similar to that seen in over radiated skin. At first there may be no clinical manifestations, or there may be protracted bleeding from the bladder. Later manifestations are ulcers and the shedding off of large bits of mucosa and muscle. Urine salts may be deposited on these epithelial defects, and lead to bladder stones or incrustation of the wall. These changes must be differentiated from those due to the advance of the cancer. Two cases are reported one in which bleeding from the bladder first began twenty one months after treatment. The patient had received 8,016 mgm. hr. of radium in eight sittings as well as two courses of intensive roentgen therapy. Upon cystoscopy vascular changes were noted between the ureteral orifices. The second case was that of a woman who had received 5,100 mgm. hr. of radium altogether. Ulcers of the bladder and incrustation resulted three years later. According to Chau (41) the symptoms are those of cystitis, tenesmus, frequency, and

bloody urine. The site of the lesion is characteristically in the trigone area. Upon cystoscopy a round ulcer with tumorous raised edges is seen. Sometimes bullous edema is present. Fistulas do not result frequently, according to this author. Laas (166) reports a case starting one year after treatment and eventuating in uremia and death. The most significant histological finding was fibrous obliteration of the blood vessels. Graves, Kuckham, and Nathanson (118) studied 683 cases of cervical cancer from the point of view of bladder complications. Two hundred and nine presented clinical signs of a bladder complication. Sixty two of the 683 presented vesicovaginal fistulas. The fistulas were mostly in advanced cases. These authors believe that such fistulas are almost always due to the invasion of the cancer, though the actual break may be precipitated by the radiation. Reradiation for recurrence after previous treatment sometime before seemed to favor the occurrence of fistulas. The authors believe that the use of radon seeds favors fistula formation. Bladder complications were more common in cases of cancer of the cervical stump. Fistulas should not result from radiation *per se* if a proper technique is employed. In general, the treatment of these bladder injuries is palliative. Maianz (184) states that Haendley found 80 cases with bladder lesions in 121 autopsies on women treated by radiation for uterine cancer.

Acute anuria occasionally results from radiation. Graves, Kuckham and Nathanson believe that this is due to an edema precipitating a complete ureteral obstruction in cases in which marked partial occlusion has already taken place due to the cancer. Maianz reports four such cases. Fulcomis (102) reports a case of partial anuria following an initial radium treatment for recurrent cervical cancer. While the ureters were narrowed by the cancer the narrowing was not severe enough to explain the anuria. These authors also believe that edema is the precipitating cause.

Dalby Jaxox, and Miller (51) report 14 interesting cases in which fracture of the femoral neck

occurred following pelvic radiation for gynecological malignancy. All of the patients had received roentgen therapy, and three had received radium in addition. These fractures occurred on an average of seven months following treatment in women whose average age was fifty-seven years. All had x-ray studies, and a few were studied microscopically as well. Metastases were never demonstrated. The authors raise the question of whether these fractures were caused by degenerative bone changes due to radiation. They admit, of course, that most of these women were in the age when femoral neck fracture is quite common. However, the fairly close association with radiation therapy and the comparative youth of several of the patients inclined them to believe that radiation may indeed have been responsible.

May radiation of a benign pelvic condition later lead to cancer? This question is raised in two communications. Daniel and Babes (55) report the case of a sixty-two-year old woman in whom a uterine sarcoma was found thirteen years after roentgen radiation for a fibroid. They found one similar case in the literature in which the interval was eight years. Strachan (257) reports two cases of cancer following 2,400 mgm. hr. of radiation with radium for menorrhagia, two and three years later, respectively. He states that Fournier in 1935 reported cases occurring ten years after radiation and had found 65 other cases which had been recorded. Strachan does not believe that radiation caused cancer in the cases which he reports, but brings out that radiation does not prevent cancer from arising independently at a later date.

In confirmation of previous reports, Richman (232) found a transient leucopenia in nine patients irradiated for cervical cancer with a 300,000-volt apparatus. The blood counts reached their low points of about 2,000 per cu. mm. in the third week following treatment. Three of the patients had a relative lymphopenia as well.

Control of Pain In late and inoperable cases of cervical carcinoma, pain is often a prominent and distressing feature. The pain is usually sciatic in distribution and is due to involvement of the iliac glands. It may, of course, be visceral due to the local spread of the cancer, or in almost any location due to metastases. The pain-relieving measure to be selected naturally depends upon the type and location of the pain, as well as upon the individual herself, and the availability of the measures. Danforth (53) describes the methods at our command. Simple medication is sufficient in many cases, preparations such as aspirin alone,

aspirin and codeine, and morphine are useful. Calcium gluconate and cod-liver oil have proved beneficial. The subarachnoid injection of 95 per cent alcohol between the twelfth dorsal and fourth lumbar vertebrae is sometimes of value. In employing this procedure, one runs the danger of injuring motor nerves. In cases in which the pain is great, yet the life expectancy is a number of months or years, chordotomy has been used. In 1927, Banzet covered this subject fully. The anterolateral column of the cord is divided five segments above the level of the pain on the opposite side. The objections to this measure are the prolonged hospitalization which may be necessary and the danger of producing disabilities by injury of the motor nerves. A third operative measure is presacral sympathectomy. This, of course, is of no value unless the pain is local, pelvic, and visceral, which it usually is not.

Results. The majority of the results reported are for radiation therapy, usually a combination of radium and high-voltage roentgen ray treatment. A few reports represent results of radical surgery for early cases and radiation for the remainder. Evaluation of these results is extremely difficult because so many variable factors enter into the make-up of the figures. For instance, the relative proportions of early, borderline, and late cases comprising a series influences the absolute-cure figure tremendously. It is obvious that when an unusually high absolute five-year cure is reported the explanation lies in an unusually high proportion of comparatively early cases in that series, when a very low figure is reported it means a large proportion of advanced cases. A glance at the tabulated results will prove this readily, particularly the figures of Berkeley (16), Mitra (202), and Schreiner and Wehr (250). These authors report the low absolute five-year-cure figures of 14.3, 11.1, and 12.9 per cent, respectively, but, in all instances the material was made up largely of advanced cases. Further, several variables influence the type of material: one is individual variation in classifying the cases with regard to Stages 1, 2, 3, or 4; another is the fact that various clinics receive different types of material depending upon the character of the clinic, its location, and the educational status of the laity in that location. Schreiner and Wehr give a table comparing the types of cases received at different clinics. For Stage 1 the variation was from 2 to 18.9 per cent; for Stage 2, from 6.3 to 18.6 per cent, for Stage 3, from 28.6 to 69.3 per cent, and for Stage 4 from 10.1 to 47.7 per cent. Still another variable, emphasized by Berkeley, exists in the

FIVE YEAR CURES

Regaud Technique

Author	No. of cases	Percent stage of cured cases						Comments
		Stage 1	Stage 2	Stage 3	Stage 4	Follow up operations	Absolute cure	
Henkensfeldt Jansen (135) Amsterdam	372	60	32	20.8	0	0	35.1	Radiation mortality 3.2 per cent
Guilera (125) Barcelona	274	45	39.7	19.7	4.5	0	23.0	Radiation mortality 2.3 per cent
Swanberg (260) Radium Institute Paris	464	75.6	42.6	31.8	1.7	0	35.6	Operable cases 45 per cent Inoperable cases 55 per cent
Gernez and Mallet (109) Genoa	232	64	50	45.5	7	0	3.8	Operable cases 19.7 per cent Inoperable cases 18.9 per cent (mostly Stage 4)
Regaud Technique (Collection of Todd) (269)	1106					0	27.7	As compared with 20.0 per cent for American Technique and 14 per cent for Stockholm Technique ²⁴
Lacassagne (1937) {Quoted by Schreiner and Wehr (250)}	350					0	20.0	
Guedes (123) Lisbon	209	73.3	31	14.0	0	0	25.7	1926-1928 Regaud Method since 1924

Stockholm Technique

Author	No. of cases	Percent stages of cured cases						Comments
		Stage 1	Stage 2	Stage 3	Stage 4	Follow up operations	Absolute cures	
Berkeley (16) London	168	50	19	14	5		14.3	Operable cases 30.4 per cent Inoperable cases 69.6 per cent Stage 4 .35 per cent
Chydenius (43) Helsingfors	280					72 Stages 1 2 and 3 with ra- diation alone	21.1	25 cases operated upon after radiation 122 cases were Stage 4
Brens (21) London	67	40	30	16.6	0	4.3	24.0	Operable cases 52.2 per cent Inoperable cases 47.8 per cent
Heyman (1935) (Quoted by Schreiner and Wehr (250))	153						21.3	
Stockholm Method (Collection of Todd) (260)	1203						23.4	

fact that far advanced hopeless cases are not accepted consistently in all clinics and are incor-
rectly excluded from the calculations. Another
important variable exists in the type of therapy.
Some use radium alone, some combine radium

with roentgen rays, some employ radical operation
for the operable cases. The techniques of apply-
ing radium differ as well as the roentgen ray
machines and dosages. All these variables make
the selection of superior methods an impossible

Other Methods

Variations of the Stockholm and Regaud Methods, Individual Methods, Unstated Methods

Author	No of cases	Percentage of cured cases						Comments
		Stage 1	Stage 2	Stage 3	Stage 4	Following operation	Absolute cures	
Schreiner and Wehr (250) Buffalo	955	68 4	34 4	20	1 5	47	12 9	Only one-tenth of the cases were in Stages 1 and 2
Scheffey and Thudium (239) Philadelphia	156					55 5	19 2	Operable cases 11 5 per cent Six patients operated upon
Randall (230) Iowa	123					68	17 8	
Costolow (46) Los Angeles	298						19 5	
Ward and Sackett—1935	457						24 9	
Norris—1935	153						22 8	
Schmitz—1933	488						19 1	
Burnam—1933	1578						15 9	
Crossen and Newell—1934	121						23 9	
Voltz—1935	2202						19 4	
[All quoted by Schreiner and Wehr (250)]								
Shaw and Dougal (253) Manchester	94						41 4	
Ward (276) New York	493						25 7	
"American Method" (Collection of Todd) (269)	3130						20 9	
Radiation in General (Collection of Todd) (269)	3509	63 4	36 4	20 6	1 8		23 6	

Combinations of Operation for Early Cases and Radiation

Author	No of cases	Percentage of cured cases						Comments
		Stage 1	Stage 2	Stage 3	Stage 4	Following operation	Absolute cures	
Freisfeld (96) Munster	100						23 2	
Gál (105)							20 8	
Mitra (202) India	352						11 1	Bulk of cases advanced
Burchhardt (32) Dresden	473						32 9	Wertheim 80 Radiated 382 (Stockholm)
Finlaison (93)	458	64 6	23 8	6	0	Oper alone 40 Oper + Rad 54 8	18 1	

Operation Alone

Author	No of cases	Percentage of cured cases						Comments
		Stage 1	Stage 2	Stage 3	Stage 4	Following operation	Absolute cures	
Malewa and Makarow (185)	41					60		
Bonney (23)	384					39		Mortality 14 per cent
Collection of Todd (269)	2331					40		Mortality 10.7 per cent

task. All in all it appears that throughout the world from one fifth to one quarter of all women presenting themselves with cervical cancer remain cured for five years, whatever the method of treatment. The figures of the authors listed are tabulated, as well as those of other authors whom they quote.

For purposes of comparison an effort is made to group these results according to the various methods of treatment which were discussed in the preceding section.

The data published during 1936 are insufficient to throw much light upon the old argument of operation versus radiation in operable cases. Todd (269) attempts to do so by comparing a collected series of surgically treated cases reported by Weibel, Bonney, Faure and Peham and Amreich with a collected series of radio logically treated cases reported by Wintz, Curie, Hartmann, Laborde, Crossen, Schmitz, Burnam, Lacassagne, Voltz, Healy, Heyman, Gasset and Wallon, Nahmacher, Eymier and Ward. Operation was employed in 2,331 cases with a five year cure in 40 per cent. Radiation was used in 1,109 cases in Stage 1 and 2 (cases of comparable extent) with a five year cure in 45.2 per cent. Todd concludes that radiation is best. It is surprising that practically no results are reported for operation after previous radiation. Emblason reports cure in 40 per cent after operation alone and cure in 54.8 per cent when radiation and operation were combined.

Comparison of the various methods of radiation is so seriously affected by the inevitable variables discussed that the reviewer hesitates to draw conclusions. While on the surface the results reported for the Regaud technique appear to be superior to those obtained by other methods, more critical analysis seems to show that the higher rates of cure simply mean more early cases. Todd's comparison of the collective results obtained by the Regaud, Stockholm and American techniques is interesting, cure being obtained in 27.7, 23.4 and 20.9 per cent, respectively.

This comparison definitely favors the Regaud technique, but the possibility of variations in the material is not considered. The reviewer does not believe that the evidence will allow the conclusion that one method is significantly superior to another.

CARCINOMA OF THE CERVICAL STUMP

Articles by Bryan and Trabue (29), Cureleanu (49), Faulkner (83), Goodall (113), Scheffey (138), and Thevenard (267) deal with the interesting subject of carcinoma of the cervical stump. This condition is not encountered frequently. The incidence is reflected by the figures available in the articles which are tabulated below. The percentages represent the number of cases of cervical carcinoma which are cervical stump carcinomas.

Kretschmar and Gardiner	1.7 per cent
Meigs	2.1 per cent
Richardson	3.0 per cent
Scheffey	3.6 per cent
von Graff (collection)	4.1 per cent (from 25 to 113 per cent)

Some of the cases are really instances of error in diagnosis, the cancer being present at the time of operation. These regrettable occurrences can be avoided by careful examination of the cervix before operation. Generally these errors occur when fibroids are also present. The presenting symptom, bleeding, is attributed to the fibroids and operation is performed without further ado. As Scheffey brings out, it is not always easy to decide whether cancer was present at the time of operation or developed subsequently. Meigs (197) counts in his series of 26 cases only those developing one year or more after operation.

The frequency with which cancer develops in the cervical stump after a supravaginal hysterectomy is naturally of the utmost importance. Unfortunately, as Scheffey states, this can be determined with relative accuracy only because the follow up of consecutive cases of supravaginal hysterectomy is far from perfect. The available figures are tabulated on the next page.

Albrecht	o 4 per cent
Fahndrich	o 4 per cent (in almost 20,000 cases)
Lincoln	6.5 per cent
Meigs	o 13 per cent (Hospital population in contrast to 18 per cent cervical carcinoma in general)
Richardson	less than 1 o per cent
Scheffey	o 9 percent (in 354 cases, an 80 per cent follow-up)
von Graff	o 62 per cent

The results of treating cervical stump carcinoma are universally bad. Furthermore, both surgical and radiation treatment are more likely to produce injury in the surrounding structures, especially the bladder, in these cases than in other cases of cervical cancer. This is true because of the changed relationship of the bladder to the cervix, its proximity to the top of the cervical canal. Of Scheffey's ten cases, 42.8 per cent remained cured for five years. Treatment was radiation. The figures of others are quoted, Healy and Arneson obtained five-year cures in 14 per cent, Sackett in 48.4 per cent, and von Graff in 9.3 per cent. Of Meigs's (197) 26 patients only 7.6 per cent remained alive after four years. A variety of treatment was employed. Cureanu (50) quotes Sejourne who obtained 6 five-year cures with radium in 80 cases, and Waldeyer who cured 5 of 8 patients with surgery, and 1 of 6 with radium. These figures adequately illustrate the poor prognosis in cases of cervical-stump carcinoma. Very great interest, therefore, revolves around the question of prevention. The most obvious means of preventing this condition is the routine employment of total hysterectomy instead of subtotal or supravaginal hysterectomy. However, as cancer arises so infrequently in the remaining stump, the complete operation is not justified unless its mortality can be kept practically as low as that of the subtotal operation. Scheffey believes that the incidence of stump carcinoma is comparatively less than the increased mortality and morbidity resulting from complete hysterectomy, as compared with the supravaginal operation in the hands of the average operator. Figures on the comparative mortalities of the two operations are given by Faulkner (83), Bryan and Trabue (29), Meigs (197), and Scheffey (238), and show a slight though definite advantage for the subtotal operation. It should be pointed out that this difference in mortalities would probably be a

great deal larger if the total operation had been used as routinely as the subtotal operation has been. The figures as quoted represent past practice, during which patients subjected to the total operation were a selected group in the main, selected in the sense that this operation was avoided when the patient was a poor surgical risk, or the operation was a difficult one from other points of view. The mortality figures available in these articles are tabulated below.

Goodall lists as disadvantages of the total operation, greater operating time, greater requisite skill, greater blood loss, greater danger to the vital organs, and greater technical difficulty if the pelvis is deep or the uterus fixed. However, he regards these disadvantages as of minor importance, and believes that this operation entails fewer immediate complications (he had three times as many cases of thrombophlebitis develop after subtotal hysterectomy operations); fewer remote sequelæ, such as carcinoma; and smoother recoveries. He favors the total operation for the skilled and experienced surgeon, but realizes that the results of the average operator might not be so good. Other possible disadvantages of the total operation as brought out by the discussers of the article by Bryan and Trabue are vaginal shortening and dryness of the vagina. These authors believe that the total operation should be the procedure of choice. Besides the threat of malignancy, they list as disadvantages of the subtotal operation the possibility of subsequent discharge and the growth of polyps.

In general the figures seem to indicate that if the total operation were performed routinely by the average operator, more patients would be lost through the increased mortality of that operation than would be saved from malignancy developing in the cervical stump. Scheffey expresses what appears to be a sound belief that routine hysterectomy is not rational, even in the

Scheffey
Siddall and Mack (collected series)
Faulkner
Bryan and Trabue (collected series)
Meigs
Meigs (8 observers)

Subtotal operation	Total operation
2.6 per cent	6.4 per cent
2.6 per cent (7,795 cases)	3.0 per cent (4,539 cases)
2.3 per cent (653 cases)	2.6 per cent (821 cases)
2.73 per cent (21,945 cases)	3.28 per cent (8,442 cases)
2.9 per cent	4.4 per cent
from 0.79 to 4.4 per cent	from 0.45 to 6.9 per cent

presence of a diseased cervix. *In lieu of complete hysterectomy*, thorough preliminary examination of the cervix with biopsy and with cauterization or resection if necessary, is recommended. Careful examination should be carried out even when the pelvic pathological condition is apparently well defined. In some cases presenting no insurmountable technical difficulties, the complete operation is advised. Meigs concurs in this view as do the discussers of the article by Bryan and Trabue.

FUNDAL CARCINOMA

Etiology and Pathology. The cause of fundal carcinoma remains as obscure as ever. The possible relationship of endometrial hyperplasia and adenocarcinoma of the endometrium is an interesting one and is receiving more and more attention. Unfortunately opportunities to trace the possible development of the former into the latter are rare. Novak and Yui (216) studied 804 cases of endometrial hyperplasia from the material at the Johns Hopkins Hospital. In 14 there were marked proliferative changes suggesting carcinoma. Forty of the hyperplasias occurred in women past the menopause. These authors believe that the responsible factor is hyperestrinism. Approaching the problem from the opposite direction they also studied 104 cases of fundal adenocarcinoma. In 24 per cent, areas of hyperplasia were present. Some of the histories of the carcinoma cases suggested a pre-existent endometrial hyperplasia. The authors believe that there is a developmental association between the two conditions and that hyperestrinism to which carcinogenic properties have been attributed is responsible. A review of the histories of 97 cases of fundal carcinoma led Murphy (208) to conclude also that a functional abnormality exists in the reproductive organs of these women. Pampanini (219) is likewise inclined to take stock in this hypothesis. This author describes a case in which a fundal carcinoma developed two years after radiation treatment for a cervical cancer. A few other cases are quoted in which cancer followed radiation. Pampanini wonders if radiation does not occasionally break down resistance to cancer growth in women who have a growth propensity. In support of his idea that there are cancer growers he quotes the cases in the literature of associated fibromyomas and fundal carcinoma and of menorrhagias due to endometrial hyperplasia leading to carcinoma of the fundus. It is quite likely that the adenoma malignum which is considered a malignancy of low order, represents a transition stage between

hyperplasia and true adenocarcinoma. In this same general category should be placed the uterine adenomas described by Liebow (177) and Zuckermann (287) the former's case being that of a woman of eighty, the latter's a woman of forty-five. In both, the uterus was filled with a bulky papillary growth exhibiting no invasion and no microscopic characteristics of true malignancy. Indeed, all reports of fundal carcinoma point to a comparatively slow development, as attested by the long duration of symptoms an average of from eighteen to twenty-four months in many instances associated with comparatively well confined growths.

Attempts to divide cases of adenocarcinoma of the fundus into pathological types based upon cellular differentiation continue. Murphy (208) in his report of 197 cases admitted to the State Institute for the Study of Malignant Diseases at Buffalo, describes 6 types. Given in the order of ascending malignancy his material comprises 9 cases of adenoma malignum I, 76 cases of adenoma malignum II, 75 cases of adenocarcinoma A, 20 cases of adenocarcinoma B and 2 cases of adenocanthoma. The classification is similar to that of Healy and Cutler. Murphy analyzes the various types from the point of view of age, marriage, pregnancy, symptoms, signs, treatment and results. The difference in the figures for the various types is not striking. This author concludes that determination of the histological type is of little value in determining the prognosis without reference to such important factors as the extent of the growth, its accessibility, and the general reactionary power of the host.

An interesting histological variation of the usual adenocarcinoma of the endometrium is the squamous cell growth. Some of these growths in which there is no trace of a columnar cell origin are described by Gellhorn (107), others in which there are small areas of squamous cells by Goldschmidt (112) others in which there is a coating of squamous cells without submucous spread the so-called "Zuckerguss Krebs" by Esen (81) and Lissowsky (179). Considerable discussion has arisen concerning their origin. Goldschmidt and Lissowsky think that they develop from heterotopic collections of germinal or müllerian epithelium and Engelhard (78) agrees that metaplasia is insufficient to explain the variations in the cellular make up of endometrial carcinomas. He favors the embryonic origin also.

The association of fundal carcinoma and uterine fibroids is of great importance because of the diagnostic problem created. The diagnosis of cancer is often not made, the signs and symp-

toms of the fibroids masking those of the cancer. In a study of 229 cases of fundal carcinoma, Norris and Dunne (214) report the occurrence of associated myomas in 98. In 42 of these, the presence of cancer was unsuspected until revealed by microscopic examination of the curettings. Healy (131) also emphasizes the importance of curettage in cases of uterine fibroids to exclude the presence of cancer. Ducuing and Guilheim (74) found 30 coincident corporeal adenocarcinomas in 580 cases of fibroids. They believe that the presence of a myoma may create a predisposition to cancer development.

Heyman (137) comments on the difficulties encountered in making statistical reviews or comparisons of cases of corpus cancer. In some cases it is difficult to distinguish between true corpus cancer and other forms of adenocarcinoma in the uterus. Certain cases of adenocarcinoma can be demonstrated histologically in both the cervix and the corpus. Where should such cases be placed? At the Radiumhemmet they are being grouped as a special class under the heading *carcinoma corporis et colli uteri*. Occasionally a similar question arises when cancer exists in both the corpus and the ovaries. These cases are likewise being classed separately as *carcinoma corporis et ovarii*.

Carcinoma of the fundus metastasizes to the ovaries in a small but definite number of cases. Not always is this extension evident to the naked eye or to the palpating fingers. The practical application of these facts is that in any operation for fundal cancer the adnexa should always be removed whether they appear to be involved or not. Popovici, Marinescu-Slatina and Ghimpeteanu (224) report a case of bilateral ovarian metastases from a corpus cancer in a woman of thirty-four years in which the pre-operative diagnosis was uterine fibroid with double adnexitis. They call attention to the attendant diagnostic difficulties, particularly in women under forty in whom this disease is quite rare. Two cases are reported by Masciottra and Martinez de Hoz (189) which also illustrate the difficulties in diagnosis. In one of the women the most prominent finding was a large ovarian cyst which was associated with a menorrhagia. This cyst was removed alone and proved to be a cystadenocarcinoma. The other pelvic organs which appeared normal at laparotomy were not disturbed. The menorrhagia continued. Eventually a second operation was performed, at which the uterus and the remaining tube and ovary were removed. The uterus contained a typical adenocarcinoma which was considered the original growth, the

second unenlarged ovary also contained a metastasis. The second case was of interest because of the association of a typical fundal adenocarcinoma of the uterine corpus with metastases in both of the grossly normal appearing ovaries. These authors estimate from reports in the literature that ovarian metastases exist in from 2 to 12 per cent of all corporeal cancers. Zahala reports 11 per cent, Schmidt 16.5 per cent in autopsies, Offergeld 7 per cent, Norris, Novak and Weibel, and Vogt estimate from 2 to 4 per cent, Schottlaender and Kermauner report 3 per cent, and Walbruch 12 per cent. In 11.9 per cent of 520 cases of fundal cancer, Offut found associated ovarian cancer and in 8.6 per cent of 616 cases of ovarian cystadenocarcinoma he found associated fundal carcinoma. Norris and Dunne (214) report the association of ovarian metastases in 19 of 279 cases of fundal carcinoma. It is possible that the coexistent ovarian and fundal carcinomas are each primary, not successive, in some instances; this is brought out in both of the reports. The possible modes of spread are outlined by both Popovici, Marinescu-Slatina, and Ghimpeteanu (224), and by Masciottra and Martinez de Hoz (189), spread may occur through the lymphatic channels, the most important route; through the blood stream; by contiguity, and through the tubal lumen. The latter authors describe in detail the lymph channels and blood vessels of the uterine body and show their intimate connection with those of the ovaries.

Fundal carcinoma may metastasize anywhere once it has invaded the blood stream. Distant isolated metastases are rather rare, however. Fobe (95) describes an unusual case in which a metastatic nodule was found in the acromion six years after an operation for fundal carcinoma. The nodule was proved to possess the typical structure of uterine adenocarcinoma.

Clinical Aspects. Fundal carcinoma is typically a disease of the postmenopausal age. Murphy (208) reports the average age of his 197 patients to be 58.8 years. A much larger number (46.3 per cent) of the patients in the series of cases reported by Norris and Dunne were between 50 and 59 years than in any other decade. The extremes were wide, however, their youngest patient was twenty, their oldest seventy-six. The figures published by both of these observers indicate that parity is not related to this disease. Bleeding is the most constant symptom, and was the first symptom in 80 per cent of the latter series. Usually the bleeding is intermenstrual in type. Other discharge may follow, as reported in 42.1 per cent of Murphy's cases. Pain is a late

symptom, and comparatively infrequent Back ache and urinary complaints are noted occasionally. As previously mentioned, the average duration of symptoms before consultation is long indicating slow evolution of the growth. Occasional cases are seen in which symptoms have been present for as long as eighteen years or as short a time as two weeks (Murphy). The average duration of symptoms in the Norris-Dunne series was seventeen and nine tenths months, and in the Murphy series from one and one tenth years to two and three tenths years in the different types. All authors point out that the duration of the symptoms cannot be correlated with the curability. In some instances, symptoms may have been experienced for a prolonged period, yet the growth remains confined to the uterus.

Pelvic examination is not always revealing in corpus cancer. The uterus may be normal in size. The confusion which may arise when fibroids are present has already been mentioned. In Murphy's series 82.9 per cent of the unoperated cases presented enlarged uteri on entry. Extra uterine masses, interpreted as metastases were present in 29.9 per cent.

The necessity of curettage in all cases of postmenopausal bleeding in order to exclude malignancy is emphasized by Berard and LeClerc (15). They found cancer in 56 of 98 such cases. This leads them also to the assertion that it is not proper to assume that all cases of postmenopausal bleeding not due to an evident cause are due to fundal carcinoma. Such a belief would lead to many unnecessary operations.

Treatment. Most observers advise panhysterectomy with removal of the adnexa when the growth is confined to the uterus, and when the age or general condition of the patient does not contra-indicate surgery of this severity. It is advisable to combine operation with radiation. Some employ radium pre-operatively, others deep x-ray therapy, others postoperative roentgen therapy, and still others employ various combinations of these methods. Doederlein (70) states that the slowness of the growth makes possible by surgery an absolute five year cure in 20 per cent more cases than is obtainable in cervical cancer. He occasionally employs the vaginal operation and always combines operation with postoperative roentgen therapy. Degrais (59) favors surgery when it is possible but feels that radiation gives good results in those cases in which operation is contra-indicated. His radiation technique involves the use of small quantities of radium over a long period of time.

No results are given. Kilgore (135) favors panhysterectomy, preferably preceded by radium exposure. No results are reported. Healy (131) advises a preliminary cycle of 750 r followed by 3,600 mgm hr of radium. This radiation should be followed by panhysterectomy in from four to ten weeks when possible. If operation is contra-indicated a more complete cycle of roentgen therapy is added. Murphy (208) advises the inclusion of radiation in all cases and believes that operation should be confined to the adenoma malignum types. Norris and Dunne (214) advise panhysterectomy plus pre-operative radium irradiation. Since 1930, their radiation has consisted of 4,800 mgm hr of intra uterine radium, with a 1 mm platinum plus 2 mm rubber screen, followed by a course of roentgen therapy. Arnesen (7) also favors a combination of radiation and surgery. Dickinson (69) prefers pre-operative x-ray, fearing that the introduction of radium into the uterus might force infected material into the peritoneal cavity. Volbracht (274) advises operation when possible. He believes that the vaginal approach is the safer method. Operative mortalities reported are as follows: Norris and Dunne 4.3 per cent, Hovervogt 8.9 per cent, Volbracht 7.1 per cent, Gal 1.2 per cent, Reles and Fobe 35.7 per cent (in 14 cases pulmonary embolism occurred 4 times).

A very interesting contribution to the subject of treatment is offered by Heyman (137). The method of applying radium in vogue at the Radiumhemmet up to 1929 was by the insertion of a single tube varying in length according to the length of the uterine cavity. This tube contained from 35 to 45 mgm of radium element and was left in place long enough to obtain a dose of 1,500 mgm hr. A similar application was repeated in three weeks. Supplementary vaginal application was also made. Thus, with minor variations, is the method employed almost everywhere. Since this method did not take into account variations in the form and cubic capacity of the uterine cavity, Heyman and his colleagues have worked out a new method in which the uterine cavity is packed with a sufficient number of less powerful tubes to fill it. These tubes are 20 mm long, with an outside diameter of 2.8 mm and contain 8 mgm of radium. Their wall thickness is equivalent to 1 mm of lead, and they are screened with an additional 2 mm of aluminum. Experiments were carried out to determine the intensity distribution in the uterine wall with different packs, and to determine the time of irradiation necessary to obtain the same physical dose in different instances. These results were

Author	No of cases	Absolute 5-yr cures	Operated cases	Radiated cases	Comments
Heyman (137)	232	42 2	63—(79 4 per cent cure)		Treatment mainly radiological, combined with operation when radiation failed. Operation plus postoperative radiation
Volbracht (274)	286 (up to 1925) 112 (1926-1930)	44 8 59 8	133 70 (67 1 per cent cure)	144 42 (47 6 per cent cure)	Nine cases were not treated
Norris and Dunne(214)	211	44 5			
Healy (131)	217 (1918-1931)	36 4			Various treatments
Murphy (208)	108	35 1			Various treatments
Randall (230)	34	29 4			
Burckhardt (32)	66	42 2	12	52	Two cases were not treated
Gál (105)			72 8 per cent cure	(up to 1927 40 per cent cure) (since then 53 3 per cent cure)	
Arneson (7)	91 (4 observers)	60	927 (57 per cent cure) (13 observers)	998 (37 per cent cure) (17 observers)	Treatment by operation and radiation

tabulated which makes it possible to read off directly the treatment time for each of the arrangements of the packs. The plan is to give 1,500 mgm hr twice at a three weeks' interval. Comparison of two, three, and four-year results with those obtained by the old method seems to indicate that the new method is considerably better.

The results of treatment obtained by those reporting them is given in tabular form above.

It is practically impossible to compare the results of radiation and surgery since operation

has been used whenever possible by most observers and radiation alone has been reserved for locally inoperable growths or for those whose age or general condition contra-indicated surgery. Therefore, the material is not comparable. Heyman's material approaches nearest to being suitable for such a comparison, yet Heyman himself does not venture a definite conclusion. While he is working on an improved radiation technique for which he has hopes, he believes that a combination of radiation and surgery, when possible, offers the best prognosis.

[To be concluded]

ABSTRACTS OF CURRENT LITERATURE

SURGERY OF THE HEAD AND NECK

HEAD

Adson A W and Hempstead B E. Osteomyelitis of the Frontal Bone Resulting from Extension of Suppuration of Frontal Sinus. *Surgical Treatment Arch Otolaryngol* 1937 25 363

Early drainage of a suppurative frontal sinus will preclude an extension of the infection to the frontal bone and the brain. Although the infection is usually attributable to the staphylococcus pyogenes aureus it may be extremely virulent and involve the diploic channels and the emissary veins of the skull within forty eight hours. The procedure the authors present is advantageous in preventing the usual deformity that follows an operation on the frontal sinus and permits the removal of all sequestra and a thorough drainage of the frontal sinus by removing the posterior table of the sinus. The treatment of acute suppurative sinusitis is medical during the very acute stage. Shrinkage with tampons of the mild silver protein argyrol followed by suction and the application of hot packs often produces relief. It is sometimes necessary to resort to codeine and other drugs. At the clinic the authors avoid surgical intervention in the acute stage because of the danger of inciting an osteomyelitis. If it is not possible to relieve the pain with any of these measures the authors sometimes drain the frontal sinus externally at its lower inner angle. This operation is purely for the establishment of drainage. In many cases of chronic sinusitis the condition can be relieved by removal of the anterior end of the middle turbinate bone and enlargement of the nasofrontal duct. If the intranasal operation is not sufficient, the external approach is used and the method of Lynch which preserves the external table is followed. If the external table has been perforated the rules laid down by Killian are followed. Craniotomy is not considered as long as there is no evidence of an extension of the infection into the frontal lobe. When this has taken place it appears wiser to combine the sequestrectomy for the osteomyelitis with a thorough drainage of the frontal sinus by removing the posterior table than to perform two separate operations. When the skull has become involved the swelling and edema extend upward over the frontal bone from the periorbital tissues. The roentgenographic examination is extremely valuable as rarefaction of bone may be demonstrated before fluctuation appears. Roentgenography also demonstrates the extent of the involvement of the two tables of the frontal sinus. As soon as evidence of osteomyelitis has been demonstrated surgical intervention should be instituted. The usual tendency is to employ small stab wounds. These are ineffec-

tive because while they allow for limited drainage they do not permit the removal of necrotic bone.

The surgical principles include (1) adequate drainage of the frontal sinus (2) removal of the pus necrotic bone and all white dead bone (3) preservation of the periosteum if possible and (4) concealment of the incisions of the scalp within the hair line. The last is accomplished by employing a coronal incision placed in the hair line. If the lesion has been operated on early in its course the infection will be very limited but if the pathological process has been allowed to continue for days or weeks it will be very extensive and may involve both halves of the frontal bone and possibly the adjacent bones. It is not only important to remove the sequestrum the island of necrotic bone but it is likewise important to remove the adjacent dead bone even though it involves both tables of the skull. The necrotic bone is removed with the curet and rongeur. Occasionally a cranial bur is required to perforate the inner table of the skull as it is equally important to remove the inner table of dead bone as well as the outer table. The extent of the operation depends on the extent of the bony involvement. Since the osteomyelitic process usually involves both tables of the frontal bone an intracranial exposure of the posterior wall of the frontal sinus should be obtained. The frontal sinus should be extenterated by the posterior approach by removing all of the posterior wall of the infected frontal sinus. Following complete sequestrectomy and the extenteration of the frontal sinus the entire surgical field is washed with pure tincture of iodine. The frontal sinus is packed with gauze soaked in tincture of iodine. Additional strips of similar gauze are laid in the bony channel and all are brought out through the suture line. Extraperiosteal infection and infection of the scalp if present are drained by incisions through the periosteum from underneath the flap. Extreme care is employed to avoid injury to the periosteum covering the defect over the craniotomy as preservation of the periosteum stimulates the formation of new bone and filling in of the defect. The gauze drains are shortened daily and are completely removed by the third postoperative day. The generous removal of necrotic bone, the complete posterior extenteration of the frontal sinus and the free use of the tincture of iodine result in primary healing of the operative wound. The extensive sequestrectomy as employed at the clinic has been employed innumerable times by Adson in other osteomyelitic processes involving the cranial bones. It has proved to be much more effective in cleaning up extensive processes than drainage with more stab wounds and curettement of localized regions as incomplete operations allow the

infection to continue for months. Abscesses of the brain develop invariably if improper drainage is instituted or if the infection is allowed to continue.

EYE

Joy, H. H.: The Prognosis of Postoperative Sympathetic Ophthalmia: A Statistical Study. *Arch Ophthalmol*, 1937, 17 677

The author states that sympathetic ophthalmia is too complicated a disease to permit conclusions from a small number of cases. However, his study brings out several points worthy of notice.

The final visual results, provided proper treatment is instituted with promptness, indicate that the prognosis of postoperative sympathetic ophthalmia is not necessarily as unfavorable as many authors have stated.

The final outcome in the cases in which the condition followed combined extraction of senile cataract was less favorable than in those in which it followed other intra-ocular operations.

The inflammation in the sympathizing eye was more severe than that in the exciting eye in three cases of sympathetic ophthalmia due to extraction of a cataract, which were pathologically confirmed, and in three cases of the same kind in which the condition was clinically diagnosed but in which neither eye was enucleated.

There is no indication that sympathetic ophthalmia due to iridectomy for glaucoma is particularly rare or that its course is mild.

The results in the few instances in which secondary operations were performed indicate that the exciting eye tolerates surgical intervention well and that the sympathizing eye can often be operated on safely if it is properly prepared for the intervention.

LESLIE L. MCCOY, M.D.

Berens, C.: Surgical Results in Heterotropia. *Am. J. Ophthalmol*, 1937, 20 266

Of 49 patients with varying degrees of esotropia and exotropia, including patients with alternating strabismus, which were treated by surgery alone, 94 per cent revealed persistence of heterotropia. Of 85 patients of the same type who were given orthoptic training postoperatively, 32 per cent presented correction to heterophoria, and 61 per cent presented some degree of binocular vision. Of a group of 89 such patients who received pre-operative and post-operative orthoptic training, 49 per cent presented heterophoria and 73 per cent presented some degree of binocular vision. By combining the last two groups it was revealed that heterophoria following surgery and orthoptic training was present in 70 patients (40 per cent), heterophoria for distant or near sight was present in 11 patients (7 per cent), and heterotropia persisted in 84 patients (48 per cent), and there was no record of the presence or absence of heterophoria or heterotropia in 9 patients (5 per cent). Forty-seven (70 per cent) of 67 patients with alternating esotropia or exotropia devel-

oped some degree of binocular vision. Twenty-nine (75 per cent) of 39 patients who developed alternating squint between the ages of one and four years had some degree of binocular vision following treatment. Prior to operation only 12 patients in this group were known to have some degree of binocular vision. Seven of 8 patients who had strabismus before the age of one year developed some degree of binocular vision.

It is suggested that orthoptic training may be important in the development of postoperative normal retinal correspondence by the fact that 25 per cent of 126 patients with heterotropia had false projection and after orthoptic training the number was reduced to 10 per cent.

Correction of aniseikonia seemed to be a factor in aiding fusion in 2 of 6 patients with alternating esotropia.

Of 85 patients with amblyopia, 53 (62 per cent) presented an improvement in vision.

WILLIAM A. MANN, M.D.

EAR

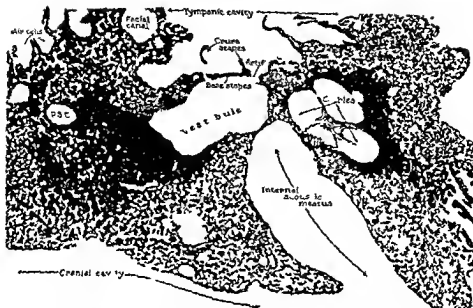
Anson, B. J., and Wilson, J. G.: Structural Alterations in the Petrous Portion of the Temporal Bone in Osteitis Deformans. *Arch Otolaryngol*, 1937, 25 560

The bones of the skull are often involved in Paget's disease. Although the petrous portion of the temporal bone is affected with the rest, the compactness of the contained otic capsule and the almost embryonic nature of some of its tissues seemingly delay the progress of the osteodystrophic changes.

The case reported was that of a white male fifty-nine years of age.

In a normal otic capsule the histological appearance is one of denseness. The petrotic capsule contains but few spaces which are large enough to be apparent in a drawing prepared at low magnification.

In Paget's disease, on the other hand, the cancellous nature of the bone is striking (see figure); the trabecular scheme is so completely modified as to bear little or no resemblance to that of normal bone and those portions usually solid are sponge-like. The elongated trabeculae have been almost totally replaced by small irregular ones. The resultant sponge-like appearance is evident on the medial tympanic wall and to either side of the vestibular window, and is more striking on the latter's anterior aspect in the region of the fissula ante fenestram. It is evident also in the bone surrounding the cochlea, in that forming the wall of the internal acoustic meatus, and in all neighboring bone even to the petrous apex. Only the bone on the posterior aspect of the vestibule, and that immediately surrounding the superior and posterior semicircular canals and the cochlea has escaped profound disorganization, the subdural bone both within the meatus and facing the posterior cranial fossa has been reduced to a layer of incredible thinness.



A section through the cochlea vestibule and vestibular window P S C indicates the posterior semicircular canal

The haversian canal have been enlarged and frequently communicate by wide orifices with the surrounding marrow spaces the content of both is a very vascular connective tissue

The lamellae are eroded to produce irregular fragments the irregularity of the reduced spicules is due to the presence of innumerable shallow pits on their surfaces which are arranged in linear series along the border of a larger depression The latter excavations which are the foveolae or lacunae of Howship, are usually occupied by large multinucleated osteoclasts

Wherever destruction of the bone is evident new formation is equally prominent and the impression is imparted that any exposed surface not eroded by osteoclasts has received or is receiving a coating of newly formed osseous matrix This appositional growth occurs through the agency of the osteoblasts arranged along the margins of the trabeculae The latter are covered by a very smooth layer of osteoid material which like embryonic bone is homogeneous and translucent On the free surface the pellicle is smooth but the deep aspect is scalloped and crenation is due to the lacunae of Howship which excavated earlier by osteoclasts are not filled in by new matrix

The two processes erosion and reconstruction are not integrated It is through the deposition of matrix that the intricate maze of separate lamellar lines is produced Stratification is no longer smooth and regular but is interrupted everywhere to form separate segments which arranged contiguously constitute the typical pattern termed mosaic

The bone immediately surrounding the endocranial canals the vestibule and cochlea is less affected by osteoclasts than that in the more peripheral regions Therefore it may be said that the petrous capsule possesses more than the usual power of resistance to the destructive agencies

MOUTH

Ahlbom H E. Predisposing Factors of Squamous Cell Carcinoma in the Mouth Neck and Esophagus A Statistical Report from Radiumhemmet Stockholm (Prädisponerande Faktorer för Hattenepithelkarcinom i Mund Hals och Spiserör. En statistisk undersökning. Material från Radiumhemmet Stockholm) Acta radiol 1937 18 103

After a survey of the frequency and sex distribution of squamous cell carcinoma the author gives an account of the material at Radiumhemmet with consideration of the influence of chronic irritation and other predisposing factors More than half of the women with cancer of the lip were pipe smokers Ninety per cent of the patients with cancer of the lip had out of door work i.e. they worked in the sunlight Ninety per cent of the men with cancer of the pharynx larynx and esophagus were town dwellers The findings are discussed in relation to the differences in alcohol consumption the type of tobacco used oral hygiene and the prevalence of syphilis The material contains a greater number of women than in other countries This may be due to the circumstance that simple achlorhydria anemia and

the Plummer-Vinson syndrome, which occur almost only in women, are relatively common in Sweden. These conditions lead to mucous-membrane changes in the upper part of the digestive tract which predispose to cancer.

In conclusion, the author discusses the possibilities of prophylaxis.

JAMES B. BROWN, M.D.

Berven, E. G. E.: The Radiological Treatment of Tumors of the Oral Cavity and Pharynx. *Acta radiol.*, 1937, 18, 16.

The author describes the methods of treatment employed and the results obtained at Radiumhemmet during the years from 1916 to 1930. In the course of that long period the methods have gradually developed into the technique now in use, the particulars of which are set forth and discussed in detail.

As a rule, the technique begins with telerradium treatment from several fields of entry. In most cases from 100 to 150 gm. hours are applied, a lead filter of 5 mm. is used, and the distance is 6 cm. The daily dosage is from 6 to 7.5 gm. hours which is given for about three weeks. This treatment produces the mucosal and cutaneous reactions, epithelitis and epidermitis, described by Coutard. When the period of reaction is past, usually after from six weeks to two months, any remaining remnants of the primary tumor are dealt with locally by surgical excision, electrocoagulation, or interstitial implantation. If any lymph-node metastases persist after the reaction they are dissected *en bloc*.

Of 457 patients with involvement of the oral cavity who were treated 114 (25 per cent), of 39 patients with carcinoma or lymphoepithelioma of the tonsils 16 (41 per cent), and of 49 patients with sarcoma of the tonsils 17 (35 per cent) lived for five years or more without symptoms.

JAMES B. BROWN, M.D.

Despons, J.: Regarding the Pathogenesis of Parodontal Cysts. An Essay on Classification of Cysts of Dental Origin (*À propos de la pathogénie des kystes paradentaires. Essai de classification des kystes d'origine dentaire*). *J. de méd. de Bordeaux*, 1937, 114, 472.

According to American classification the parodontal cyst is a subdivision of odontogenic cyst. It forms neither at the apex (radicular cyst) nor around the crown of a forming tooth (dentigerous cyst), but develops laterally. The author insists that this type of cyst is of embryonal pathogenesis, being formed from dental epithelium, particularly the tooth buds for a third dentition which in man does not generally terminate in tooth formation. This epithelium has the potential ability to produce all types of cells found in the enamel organ, which cells may all be found in these cysts.

The writer believes that the parodontal cysts behave like tumors, as they have a tendency to develop progressively and produce deformity of neighboring cavities without causing infection. The con-

tents is always aseptic unless there is an opening into the mouth which allows secondary infection. They may form adjacent to perfectly normal teeth.

He contends that in parodontal cysts the epithelium may proliferate into the underlying tissue, penetrate the capsule, and invade the adjoining bone, and for this reason recurrence after incomplete operation is frequent.

The cyst may be unilocular or multilocular. Each type has an epithelium of characteristic histological arrangement. The unilocular type is generally benign. In the multilocular type the various epithelial cells are irregular and anarchical, and therefore more malignant. They are, in fact, adamantinomas. If they present an ordinary monocystic appearance when discovered by x-ray examination, they may still be adamantinomas of latent character. In this stage complete excision may be accomplished easily. Later, when they have become definitely multilocular, they have undergone malignant transformation which makes surgical success less certain, even with the sacrifice of important tissue. For this reason histological examination is advised in all cases of cysts which are found to be questionable in clinical or roentgenological study.

KURT H. THOMAS, M.D.

PHARYNX

Minear, W. L., Arey, L. B., and Milton, J. T.: Prenatal and Postnatal Development and Form of Crypts of Human Palatine Tonsil. *Arch. Otolaryngol.*, 1937, 25, 487.

The crypts of the human palatine tonsil begin to appear during the third fetal month as solid ingrowths from the epithelial wall of the tonsillar fossa. Subsequently these epithelial processes grow, branch, and canalize, although the end of such progressive development is not reached until late childhood. The formation of a lumen usually takes place first in the distal, most rapidly growing part of an epithelial ingrowth. However, simultaneous formation of the proximal and the distal portion of the lumen occurs also.

A first phase in the development of the crypt system is characterized by a peculiarity of growth owing to which many of the epithelial ingrowths form epithelial vesicles or cystic crypts. The majority of these epithelial vesicles, attached to the permanent crypts by narrow necks, undergo progressive degeneration and disappear shortly after birth. Most of the necks are solid, but some have lumens. However, it is possible that some of the vesicles persist as the residual vesicles, or cysts, of childhood and adult life.

A second phase in the growth of the crypt system, which also begins in the early prenatal months, is marked by the appearance of new first order crypts, by the further growth of similar crypts, straight or curved plate-like, of the first and second order which escape destruction during the first phase, and by the formation of many new second to fifth order crypts which increase in number gradually up to the time



Fig. 1. Lateral aspect of the crypt system in the left tonsil at twenty-one years. The crypts are spaced farther apart than in the child but their number and order remain unchanged. In the inferior half of the tonsil the crypts have grown in length and thickness but not in actual complexity so that this region is now well filled in. Two small cystic crypts are indicated by stippling. The penicillate mucous glands in black consist of two smaller masses at the superior pole and one long consolidated spiral mass that extends along the anterior border of the tonsil.

when the full quota is obtained which is some time during early childhood.

Although the maximum number of crypts is reached during childhood later these elongate and enlarge by interstitial growth to form the definitive crypt system. In our series of models the number of first order crypts remains relatively constant throughout childhood and even until the onset of tonsillar senescence. A greater variety of shapes is found accompanying the increase in number and complexity of the crypts than occurs in earlier crypt systems. The shape of the original epithelial in growth is the principal factor that determines the shape of the crypt. Some crypts are budlike some irregularly cylindric, and some long, narrow and sinuous. But the curved or flat plate like type is

predominant in number and size. Many of the large first and second order crypts have constricted necks. Anastomosing crypts are of great rarity but have been demonstrated for the first time. The size and complexity of most crypts in the superior half of the tonsil are greater than in the inferior half. This domination persists from fetal life at which time the formation of the superior part of the tonsil occurs in advance of that of the inferior portion. From the beginning of the development of crypts into childhood the crypts of the inferior half of the tonsil are relatively short and small. The completion of growth inferiorly so that this region is filled in equally with the superior half is the most outstanding advance of the final developmental period which produces the definitive tonsil. The approximate area of the ep-

NECK

thehal lining of the adult crypt system of one tonsil was calculated to be 46 sq ins. or 295 sq. cms, whereas the exposed surface area of an entire pharynx was only 7 sq ins or 45 sq cms

The final phase in the life history of the adult crypt system is marked by progressive atrophy and degeneration, reminiscent of the late prenatal and early postnatal period. The less complex portion of the crypt system of the inferior half of the tonsil is not only the last to attain full growth, but the first to degenerate. Again, vesicles and cysts appear as by-products, and the number and order of crypts are reduced. Atrophy of lymphoid tissue and compensatory formation of fibrous tissue accompany the degeneration of the crypt system.

Ducts of the peritonsillar mucous glands establish themselves before the crypt system has attained any prominence. This explains why the ducts are so rarely found emptying into crypts, and then always near the mouth. Connection with crypts is the result of secondary incorporation. Dilated mouths of ducts surrounded by lymphoid tissue sometimes simulate simple crypts into which ducts empty, but these should not be confused with true crypts.

Any tendency to empty the tonsillar crypts through natural or artificial means must necessarily be highly inefficient owing to anatomical constrictions and the tendency of the contents of a complex convergent system to impact at the bottle-neck region of the main crypt. Such plugging is further enhanced by the circumstance that the main drainage channel is often smaller than its tributaries.

Craig, W. McK., and Knepper, P. A : Cervical Rib and the Scalenus Anticus Syndrome. *Ann. Surg.*, 1937, 105: 556

The clinical picture of cervical ribs and that of the scalenus anticus syndrome are very similar, as are also the surgical indications and operation. The symptoms result from compression or irritation of the brachial plexus and compression of the subclavian artery. Compression may be due to the presence of cervical rib, an abnormally low position of the shoulder, high fixation of the sternum and ribs, low origin of the brachial plexus, or elevation of the first thoracic rib from spasm of the scalene muscles brought about by irritation of the brachial plexus. When cervical ribs cannot be demonstrated, resection of the scalenus anticus muscle is usually all that is necessary to relieve the symptoms. In the presence of a cervical rib without tendinous attachments and without obvious pressure from behind, resection of the scalenus anticus muscle is all that is necessary; but when there is evident pressure from the cervical rib or its tendinous attachment, resection of the rib and the attachment should be carried out.

In carefully selected cases in which the symptoms point clearly to either cervical rib or the scalenus anticus syndrome, the surgical result is usually excellent.

Six cases are presented to illustrate the points in the differential diagnosis, surgical indications, and results.

SURGERY OF THE NERVOUS SYSTEM

BRAIN AND ITS COVERINGS, CRANIAL NERVES

Alpers B J and Rowe S N The Astrocytomas
Am J Cancer 1937 30 1

Admitting the inadequacies of any tumor classification the authors have attempted to group 128 cases of astrocytoma according to this system

- 1 Fibrillary
 - a Solid
 - (1) Piloid
 - (2) Diffuse
 - b Cystic
- 2 Giant cell
- 3 Cellular

The classification appears to be a logical one and not dogmatic and the authors have furnished several well chosen photomicrographs to support their text

The gross appearance of the fibrillary type varies it often being difficult to distinguish it from normal surrounding brain tissue this type is seldom necrotic Histologically it may be either piloid or diffuse, but in either case the cells may assume a perivascular grouping or line up in rows, or they may be impartially scattered through the stroma In most cases the cells are adult astrocytes but astroblasts are always to be found if searched for In the diffuse type the cells appear to be fairly evenly scattered in the fibrillar network and more often than not there are but few blood vessels to be found In the piloid type there is a preponderance of long astrocytes which deposit long fibrils lying in parallel densely packed rows These long astrocytes usually have fewer processes than the ordinary astrocyte There seems to be no relationship between the number of cells and the number of fibrils in the fibrillary type of astrocytoma and clinically the sub groupings diffuse and piloid are not sharply differentiated The location of this type is varied the age and sex incidence is not significant and patients with the diffuse type survived only a few months longer postoperatively than those with the piloid The group as a whole however constituting 82 per cent of the series supports the view that these are slowly growing tumors both clinically and pathologically

The cystic astrocytomas present the picture of a slowly growing intracranial lesion and as they occur chiefly in younger individuals they respond better to surgical treatment Characteristically they contain a mural nodule which is firm vascular and entirely of tumor tissue and they are filled with a yellow fluid of high protein content The outline is usually of the same type of cell structure as the cyst wall the piloid cell being the one most commonly found

The giant cell tumors comprise 7.6 per cent of the series and therefore seem to be a less common form

nevertheless, they are a well defined group histologically Many of the cells are multi nuclear they all contain rough cytoplasm and usually they form a dense fibrillar carpet However, the tumor is never composed entirely of giant cells, parts of them being made up of fibrillary like astrocytes Necrosis is uncommon These tumors are of a relatively slow growth they are usually located in the cerebrum and are often first discovered to be subcortical Sometimes they require a second operation and although the survival period after operation is usually very gratifying they may recur very late after radical surgical removal

The cellular type of astrocytoma does not offer any special gross features and the nuclei of the cells do not differ from those of the fibrillary type These tumors are rich in cells and poor in fibrils The cells are closely packed and there is usually a higher percentage of astroblasts present Being of a less mature histological appearance they may be expected to be clinically less benign and this seems to be borne out in their rapid progression and short clinical course
JOHN MARTIN M.D

Kessler M M Melanoblastosis and Melanoblastoma Primary and Secondary Involvement of the Brain An Anatomical Study *Am J Cancer* 1937 30 19

This article is an attempt to clarify some of the histological characteristics of the various types of melanin bearing cells and the tumors which they form There are three types of melanoblasts one is derived from epithelium and its basal cell is that of epithelium of the skin or hair follicles one is derived from connective tissue such as the choroid of the eye and one is of an undetermined origin and its cells are found clustered around the dendrites of peripheral nerves in the epithelium of the skin In contrast to the melanoblast which inherently contains melanin is the chromatophore which may contain pigment simply because of its ability to phagocytose melanin In order fully to understand the nature and proper classification of so-called melanoma chromatophoroma café au lait spots mole nevus lentigo and melanophore some distinction must be made between the melanoblast and the chromatophore

Kessler has investigated the literature on the methods of distinguishing the two cell types and by means of his own original studies shows that this may be done by use of a specific staining reaction such as the dopa reaction worked out by Bloch in the period from 1927 to 1929 or by use of comparative anatomy and embryological studies in animals that are known to contain pigment bearing cells Cellular morphology may then be studied in conjunction with either of these two methods of approach

The author presents his anatomical observation on the autopsy material of six cases one of primary melanoblastosis of the pia mater, one of primary melanocarcinoma of the meninges, and four of metastatic melanotic tumors of the brain. In the first case, which was probably congenital melanoblastosis, the pigment-containing cells had the morphological characteristics of amoeboid connective tissue cells. They were found only in the pia and the pia septa along the vessels, and the pigment was almost wholly within the melanoblastic cells, with bits of pigmented cytoplasm, lost from the cell bodies, lying free in the pia stroma. The malignant degeneration of such heterotopic deposits of melanoblasts gives rise to a tumor, in the second case a melanocarcinoma, the cells of which differ from the quiescent melanoblast. In the neoplastic cell the nucleus is highly chromatic, and the cell body is round and never attains the larger size of the resting melanoblast. The pigment tends to accumulate in the surrounding normal tissue rather than in the tumor itself, being deposited somewhat like an excretory product, while in the resting cells of melanoblastosis the pigment is almost entirely intracellular.

It seems, then, that malignancy tends to alter the ability of the melanoblast to hold the pigment it creates, for it was noted in the four cases of metastatic melanotic tumors that pigment was concentrated in gaps within the tumor proper rather than evenly distributed throughout the neoplastic area. The author has included his own conception of melanotic conditions, classed according to the embryonic origin and the degree of malignancy, stating that melanoblasts may be normally placed, such as in the hair of the negro, or heterotopic, as in pigmentation of the meninges, with malignant potentialities. He believes that melanoblastic cells arise from both ectodermal and mesodermal tissues.

JOHN MARTIN, M.D.

Sachs, E., Moore, S., and Furlow, L. T.: Direct Roentgen Radiation of Brain Tumors During Operation. *Ann Surg*, 1937, 105: 658.

Meningiomas are well encapsulated and can be removed completely. Fully 25 per cent of the gliomas, however, are likely to recur, even after a latent period of several years.

In the hope of destroying any remaining tumor cells, roentgen therapy has been used postoperatively. The medulloblastomas are especially susceptible to roentgen radiation. Small doses of x-rays are apt to develop a resistance to further radiation in certain tumors, and on the other hand, the danger to the skin and bones has limited the use of massive doses.

In 1934 a medulloblastoma was removed from a boy. Recurrence of the symptoms was readily controlled by roentgen therapy, which fact proved the presence of a radiosensitive tumor. The patient finally reached the stage where the skin would not tolerate further radiation. In May, 1936, the old wound was reopened, and all vestiges of the tumor

were removed. Fortunately there were no signs of subarachnoid implants. With the wound open and all bone and skin protected with four layers of lead, sterile towels were placed over the wound and the patient was given 4,000 r. The wound healed without reaction, and the patient was discharged in less than three weeks. There was no interference with cerebral function after the operation, which indicated that this large dose had no ill effect on the normal brain tissue.

Since then, eight other cases have been treated similarly. Five cases have each received 6,000 r without any filter, and thereby a reduction in the time of radiation from the usual one and one half hours to from thirty and forty minutes was made.

This method makes possible the use of huge doses of roentgen radiation. Although no conclusions can yet be drawn from the cases treated, it is emphasized that there were no apparent harmful effects on the patient. Further observation is necessary to determine the value of this method.

EDWARD S. PLATT, M.D.

Bracco, R.: Ganglioneuroma of the Brain (Il ganglioneuroma del cervello). *Minerva med*, 1937, 28: 326.

Bracco states that ganglioneuromas of the brain are the most infrequent tumors involving the central nervous system. They are almost always benign and are made up essentially of unmyelinated nerve fibers assembled in bundles which intersect one another in various directions. Among these fibers may be found groups of ganglion cells. These tumors usually do not produce metastases. They arise in connection with the sympathetic system and are most frequently found in the abdomen, kidney, mesentery, on the anterior surface of the sacrum, in the neck, and in the thorax. They involve the peripheral nerves, the cranial ganglia, and the dura mater less frequently, and very rarely occur in the brain.

In the majority of cases young individuals are affected. The syndrome is very indefinite and the evolution of the tumors is very slow. They are usually found in the telencephalon, which is a part of the brain which embryologically undergoes the greatest modifications.

After reviewing the literature on the subject the author reports the case of a twelve-year-old girl who at the age of five began to complain of buzzing in the right ear. This was followed by generalized convulsions and loss of consciousness in the course of a few years. She also developed an exophthalmos. Physical examination revealed in the right parietotemporal region an area, about the size of half an apple, with a smooth surface and a covering of normal skin through which a conspicuous network of veins was visible. The subjacent bone was smooth and of a cartilaginous consistency. There was also a mild paralysis of the left facial nerve, otherwise the neurological examination was negative. Spinal puncture yielded a xanthochromic fluid, and the

reactions of Noone Appelt Pandey, Bover, and Weichbrodt were all strongly positive X-ray examination showed enlargement of the sella turcica with marked thinning of the squama temporalis

On operation a large tumor was found in the right parietotemporal region of the brain which gave rise to an intense hemorrhage when enucleation was attempted. Surgery was therefore discontinued.

The immediate postoperative condition was good. After a week a second surgical attempt was made and by means of the electric knife the remainder of the neoplastic tissue was removed; then the wound was closed. The postoperative prognosis was bad, however, and the patient died after several months with a recurrence of the original syndrome.

Microscopic examination of the tissue removed at operation disclosed the presence of large ganglion cells of the epithelial type with a large nucleus placed eccentrically. These cells resembled the neuroblastic type of cell undergoing maturation. A diagnosis of ganglioneuroma was made.

Pathogenetically it seems that this tumor is due to dysembryoblastic disturbances, i.e. to local disturbances of embryonic development. The cells become detached from the rest of the tissue; their evolution is arrested and further differentiation fails to occur.

The histological diagnosis of ganglioneuroma is often not easy and the condition is most commonly confused with gliomas, giant cell astrocytomas, sympathicoblastomas and tuberous sclerosis of the brain.

The tumor described belongs to the first group of the Pick and Bielschowsky classification.

RICHARD E. SOMMA, M.D.

Coleman C. C. The Surgical Treatment of Facial Spasm. *Ann Surg* 1937 105 642

Paroxysmal disturbances of function are characteristic expressions of the surgical diseases which involve the cranial nerves as illustrated by the paroxysmal pain of the douloureux and the paroxysmal vertigo of Menière's syndrome. The facial and spinal accessory nerves also may show paroxysmal exaggeration of motor function and produce both deformity and disability.

The pathology of facial spasm is entirely speculative. Harris believes that clonic unilateral facial spasm is due to a degenerative lesion of the nerve at or below the geniculate ganglion, a theory which is further supported by the tendency of the affected facial muscles in long standing cases to develop weakness and contractions.

Bilateral facial spasm, paraspasme Sicard, appears to have a different pathological origin from that of a unilateral type; the muscle contraction of the former being tonic in character while the latter is clonic. Moreover, bilateral spasm is often accompanied by spasm of other groups of muscles affecting phonation and deglutition. Bilateral facial spasm is most probably of cerebral origin and may result from encephalitis. Parker reports two cases, one presenting a

definite Parkinson's disease and the other presenting an early Parkinson's syndrome following encephalitis.

Spontaneous recovery from well developed facial spasm probably never occurs. Starting usually as blepharospasm, the contractions spread until they involve one or both sides of the face and extend into the platysma muscles. The spasms are aggravated by excitement, activity or fatigue. In severe bilateral cases there is in addition to the embarrassing deformity interference with vision which may result in complete disability. Surgery of the facial nerve is required to restore function when the nerve is paralyzed and to reduce or abolish function when the spasms cause a disabling facial deformity.

Medical treatment and psychotherapy are of no benefit in facial spasm. Relief can be given only by paralysis of the nerve by section or by injection of alcohol. The spasm usually returns but the patient is grateful for a period of relief lasting from six to twelve months.

The author has had under observation three patients with clonic unilateral spasm and two with bilateral spasm predominantly of the tonic type.

In unilateral clonic spasm in which the greatest contraction is in the orbicularis oculi muscle group, Coleman divides the nerve through a short incision under local anesthesia. The mandibular branch of the nerve is preserved and thereby the mouth is kept balanced and the disfiguring unilateral smile is prevented. The maxillary branch is anastomosed immediately to the hypoglossal nerve. Improvement in tone in the facial muscles is discernible after about three months and in another two or three weeks feeble contractions are seen about the angle of the mouth. Recovery of the muscle groups takes place from below upward; function of the orbicularis returning last. The frontalis muscle has never resumed function. Emotional expression is not restored but may be imitated to a certain degree.

Kennedy in 1899 reported a case of facial spasm treated by anastomosis with the accessory nerve, a procedure which Adson has used in two unreported cases. To narrow the lid cleft following section of the nerve, simultaneous section of the homolateral cervical sympathetic chain is recommended. This produces a recession of the eye, a slight droop of the upper lid and a lessening of the lacrimal secretion. In bilateral cases the hypoglossal nerve should be used on one side and the spinal accessory nerve on the other. The effect of sudden bilateral paralysis upon eating and drinking should be tested by injection of both facial trunks with a 2 per cent novocaine solution. If much difficulty is experienced by the patient, a two stage operation should be done and about six months should elapse before the second side is operated upon.

All of the patients insisted on a preliminary section or an injection of the nerve with alcohol. The psychology of the situation is such that Coleman leaves the choice of the procedure to the patient after explaining what results may be expected.

EDWARD S. PLATT, M.D.

SPINAL CORD AND ITS COVERINGS

Langworthy, O. R : A Curious Illustration of "Mass Reflex" and Involuntary Micturition Following Injury of the Spinal Cord. *Bull Johns Hopkins Hosp*, Balt, 1937, 60 337.

A case is reported which demonstrates the "mass reflex," and especially the "sacral reflex," described by Denny-Brown and Robertson in 1933. The "mass reflex" was studied by Head and Riddock in 1917 in soldiers with transection of the spinal cord due to war wounds, after which the portion of the body controlled by the isolated segment became very active reflexly. Stimulation of the soles of the foot caused flexion of the legs, sweating, and evacuation of the bowels and bladder. Sex reflexes could also be obtained.

Denny-Brown and Robertson found that micturition was not immediately associated with flexion of the legs and was interrupted by stimulation of the foot because of closure of the external sphincter in response to such stimulation. They found that

vesical contraction could be induced only by stimulation of the skin supplied by the sacral segments of the cord. Violent contraction of the abdominal wall as demonstrated by Holmes, may produce vesical contraction secondarily by direct stimulation of the bladder muscle.

In the case reported, that of a young woman who had sustained an injury of the lower lumbar portion of the cord, reflex micturition became established. Impending micturition produced flexion of the toes of both feet, adduction of the right foot, and extension and internal rotation of the legs. The movements were associated with cramping pain in the urethra and the contracted muscles. Holding the toes extended postponed micturition, and voiding could be induced by stimulation of the perineal region.

Another example is given by the author in which the sensory impulses induced by the vesical distention and contraction produced reflex contraction of the flexor muscles of the legs.

EDWARD S. PLATT, M.D.

SURGERY OF THE THORAX

CHEST WALL AND BREAST

Herrell W E. The Relative Incidence of Oophorectomy in Women With and Without Carcinoma of the Breast. *Am J Cancer* 1937 29 659

The author reviewed the case records of two groups of patients to determine if possible the influence of castration on the subsequent development of malignant changes in the breast. One group consisted of 1 906 women who had received a diagnosis of and had been treated for malignancy of the breast. The second group was a control group of 1 011 women forty years of age or older who had not received a diagnosis of malignancy of the breast.

Of the 1 906 patients treated for mammary carcinoma only 28 (1.5 per cent) had undergone complete oophorectomy before the malignancy was found. If the patients who had undergone complete oophorectomy within three years or less were eliminated the incidence would fall to 1 per cent. In the control series of 1 011 patients, 15.4 per cent had undergone total oophorectomy. This means that complete oophorectomy was ten times as frequent in the women without as in those with carcinoma of the breast. EARL O LATIMER M D

Rouhier G and Oppert E. Painful Paraplegia from Triple Vertebral Metastases of a Breast Carcinoma Operated upon Five and One Half Years Previously. Cure by Radium (Paralysie douloureuse par métastases de la colonne vertébrale en triple foyer consécutives à un épithélioma du sein opéré cinq ans et demi auparavant. Guérison par le Radium). *Année Acad de chir* Par 1937 63 106

This is the case history of a woman who at the age of thirty three years was treated for a carcinoma of the breast and axillary lymph nodes by a radical mastectomy. The diagnosis was confirmed histologically by Letulle who apparently considered the tumor to be of a high grade of malignancy. When the patient presented herself again there were three metastatic foci namely in the fourth cervical and the ninth tenth eleventh and twelfth thoracic and in the fourth and fifth lumbar vertebrae.

The breast tumor was first recognized in August 1930. After the operation pain occurred in the back as early as November 1933. It was paroxysmal and gradually became more severe. Paralysis developed in December 1935. At this time the authors were consulted and the nature of the condition established.

The treatment consisted of an external application of radium placed in soft rubber cushions. Each of the three metastatic foci received 108 mc. After prolonged immobilization consolidation of the vertebrae was obtained with elimination of the pain and paralysis. This apparent cure has lasted eight months. ALBERT F DE GROAT M D

TRACHEA, LUNGS, AND PLEURA

Bird C F. Variations in the Ages Sizes and Physical Characteristics of the Main Bronchi in Relation to Their Closure. *J Thoracic Surg* 1937 6 367

The author performed a series of total pneumonectomies on dogs, using three methods of closing the bronchus. In the first method the main bronchus after isolation was crushed with a half length Kelly clamp and then ligated with heavy braided silk. In the second method the walls of the bronchus were softened by rolling between the fingers and then ligating. In the third method the bronchus was compressed by closing a half length Kelly clamp to its first notch and then ligating as before. The bronchus was severed after ligation by a sharp knife and the untreated stump was dropped back into the mediastinum. The bronchial stumps were then examined at autopsy at various intervals. The author found that the stumps were closed in all three methods and that neither crushing nor compression were necessary. In one fourth of the dogs there was found a small round cavity or narrow space with dark gelatinous walls in the center of the stump just distal to the tie. A portion of the ligature lay within this cavity and when the braided silk had penetrated the mucosa the contents of the space had discharged into the lumen. The cavities were shown on microscopic examination to be small abscesses of chronic appearance. It seemed that the healing although sound from the point of leakage was imperfect about the ligature which gradually extruded itself from its bed of sterile or infective necrosis into the lumen. However there was nothing to indicate that either crushing or compression interfered with healing in any way.

After the above experiments on dogs the author devised a simple method for determining the resistance of various human bronchi to closure by ligature and further for determining how much their resistance would be reduced by crushing or by compression. When the autopsies were performed the trachea and main bronchi were removed in one piece and tested by a simple apparatus which registered the forces involved in terms of grams. It was found that very little force was required to close the main bronchi of newborn infants. Up to the age of four years no more than 1 000 gm were necessary. From four years up to twenty five years the resistance was as high as 2 000 gm. Crushing the tissues decreases the resistance about 40 per cent. Compression about 30 per cent. From the age of twenty six to forty five the bronchi demand a force of about 3 000 gm but after crushing this was reduced about 65 per cent and after compression about 40 per cent. In the age group between forty six and sixty five resistances over 3 500 gm were not uncommon. Crushing

caused a reduction of 70 per cent and compression 40 per cent.

In the animal experiments it was noted that after two weeks the healing was very solid over the end and sides of the stump. There is a thick pad of well vascularized connective tissue in which foreign body giant cells have appeared around bits of silk. The fibrous tissue was heavy and well nourished and neither crushing nor compression seemed to have any deleterious effect on the healing.

J. DANIEL WILLEMS, M.D.

Semb, C.: Partial Thoracoplasty in Pulmonary Tuberculosis (Partielle Brustwandplastik bei Lungentuberculose). *Norsk Mag f Laegevidensk*, 1936, 97: 1194.

Collapse therapy is cavity therapy. The cavity should be collapsed entirely, but the collapse should be selective. The operative risk in this intervention must be minimal. Roentgenograms show that 90 per cent of the cavities in thoracoplasty patients are situated in the upper lobes alone. In all of the other 10 per cent with cavities in the middle and lower lobes there are cavities in the upper lobe as well. In the lateral view the cavity is located in the posterior section and slightly further forward in 84 per cent, and in the middle section and further forward in 16 per cent. No cavities were located solely in the anterior plane.

The retraction of the lung should be accomplished concentrically in three planes: from the side, from above downward, and from the front backward, just as in an artificial pneumothorax without adhesions. To achieve this end the pulmonary apex must be mobilized by extrafascial division of all the suspensory ligaments of the apex, the so-called Zuckerkandl-Sebileausch bands, which fix the apex of the lung to the neurovascular trunk, to the vertebral column, and to the mediastinum, outside of the endothoracic fascia. The ribs must be radically resected at least in their circumference in performing the apicolysis. The costal periosteum, the intercostal muscles, the blood vessels, and the nerves must be divided so that these structures are not loosened from the surface of the lung. The technique is described in *Acta chir Scand Supp* 37. Phrenic exeresis is not used before upper-lobe thoracoplasties as a rule as it works against the selective collapse. Depending on their condition the patients are operated upon in one or more stages. The postoperative mortality mounts proportionally to the number of ribs resected at one time. In all circumstances not more than from three to five ribs should be resected in the first stage. Even so, the effect of the increasing number of resected ribs is shown by the general postoperative reaction and by the number of fatal and non-fatal lung complications. In a few cases the author first performed an extrapleural pneumolysis with radical rib resection, and later an extrafascial pneumolysis in one stage. Very recently the operation is being done more systematically in more stages and, because of this,

in spite of broader indications, better results have been obtained.

Of 147 patients 10 (6.8 per cent) died within two months. After more than two months 7 died. The follow-up studies include only patients on whom sputum and x-ray studies were made. One hundred and nine patients (75 per cent) are free from tubercle bacilli. Of 15 patients with positive sputum probably 4 present bacilli coming from cavities in the other lung. In 6 patients the follow-up failed. After from one to three and three fourths years' observation of 99 patients, 67 were found to be free from tubercle bacilli and 59 were partially or completely able to work. Ten patients underwent thoracoplasty on one side with pneumothorax on the other without a death, and in 7 freedom from tubercle bacilli was obtained. Due to the careful technique of the last year and a quarter, and particularly to the increase in the number of stages of the operation, 45 patients have been operated upon without a death. In 42 patients in this series the preliminary result was complete cavity closure and freedom from tubercle bacilli.

(KORITZINSKY) RICHARD H. MEADE, JR., M.D.

Soulas, A.: Bronchoscopytherapy in Bronchopulmonary Suppuration: Its Mechanism and Results. *J Laryngol & Otol*, 1937, 52: 249.

In bronchoscopytherapy the sphere of action is limited to the trachea and the main bronchi, as the bronchoscope cannot penetrate to the depths of the lung. The procedures comprise aspiration of the secretions, swabbing, cauterization, catheterization, removal of granulations, instillation of solutions in small quantities, and lavage of the main bronchi. The aim of these procedures is the evacuation of excessive secretions, the improvement of drainage, and the avoidance of stagnation of pus in a "septic tank."

Tracheobronchial drowning is characterized by a sudden and rapid flow of secretion which may produce serious obstruction of the trachea and of the main bronchi. The author has observed two cases: (1) a patient had a collapse of the lung after operation for a pulmonary abscess, which produced a tracheobronchial flooding with pus from the abscess and asphyxia, (2) a woman had vomiting and inhalation of secretions immediately after delivery under general anesthesia, which was followed by asphyxia with heart failure. In both cases bronchoscopic treatment consisted of aspiration, which resulted in prompt disappearance of the symptoms. The means of such a cure are chiefly mechanical.

Bronchopneumonia may show a large amount of mucopurulent secretion. The author treated three patients, all of whom showed good results.

Pulmonary atelectasis is markedly relieved by aspiration of the smaller amounts of mucopurulent secretion which are present and may produce complete obstruction when associated with a foreign body. Pneumograms taken immediately after extraction of the foreign body show complete and

immediate disappearance of the atelectasis and prove the purely mechanical nature of this condition.

Broncholithiasis may produce suppurative acute thoracic pain, dyspnea, fever, and expectoration of pus. A bronchopneumogram with lipiodol shows the broncholith. Extraction is difficult when the stone cannot be reached unless by repeated bronchoscopic treatment it can be made to pass into a larger bronchus.

Pulmonary abscess does not respond to simple aspiration and often all of the procedures mentioned must be utilized or the one suitable to specific cases must be selected.

Bronchiectasis calls for two procedures: (1) the removal of inflammatory and infective conditions, and (2) the emptying of the focus of suppuration, the septic tank. The treatment consists of aspiration, injections, and lavages of the bronchi at regular intervals over a long period of time.

J DANIEL WILLEMS M D

Kautz F G and Pinner M. Periapical Empyema. Report of Three Cases with Necropsy Findings. *Am J Roentgenol* 1937 37 416

Periapical empyema is rather rare and presents clinical and roentgenological features that cause considerable diagnostic difficulties. Of the three cases reported by the authors, only one was diagnosed during life. In this form of empyema the encapsulation of pus is confined to the upper portion of the pleural cavity, not always strictly to the anatomical pulmonary apex. It may occur as a complication of an inflammatory process in either of the upper lobes or in the apex of the lower lobe. The encapsulation may lie over the anterior or posterior surface of an upper lobe or it may surround it completely. The condition is observed chiefly in early childhood.

The early diagnosis is difficult, chiefly because the clinical pictures of pulmonary consolidation and pleural effusion in early childhood are much alike and because these lesions may be coexistent. The roentgen findings also may be difficult of interpretation for precisely the same reasons. Because early surgical intervention is often indicated, every effort must be made to establish the correct diagnosis.

For purposes of diagnosis, roentgenoscopy and roentgenography are of prime importance. Rigler suggests that films be taken with the patient in the upright and prone positions and lying on his side. The last position shows the extent and the motility of the shadow. These are of importance in the early stages when the shadow fails to show the typical shape and well defined outlines. Changes in the patient's posture and in the respiratory phases may help to distinguish parenchymal consolidation from pleural effusions. In the earliest stages there may be a slight shifting of the mediastinum toward the involved side and later on with an increasing amount of pleural effusion a more or less marked displacement toward the opposite side may occur. Atelecta is pulmonary infiltration and the early

stages of pleural involvement are likely to cause a displacement toward the involved side.

In cases in which doubt exists as to whether the clinical picture is the result of pulmonary consolidation or encapsulated periapical empyema, early exploratory thoracostomy is of the greatest value in establishing a diagnosis.

ARTHUR S W TOUROFF M D

ESOPHAGUS AND MEDIASTINUM

Cain A & Solomon I. A Contribution to the Study of Radiosensitivity in Cancer of the Esophagus. (Contribution à l'étude de la radiosensibilité du cancer de l'œsophage). *Presse méd* Par 1937 45 334

The authors state that cancer of the esophagus as well as cancer of the stomach and rectum is especially resistant to radium therapy. All attempts with x ray and radium treatment have led to only temporary improvement of the patient's condition. Permanent cures are so exceptional that if one is reported an error in diagnosis is often suspected.

In the majority of the cases of esophageal cancer the physician is confronted with epidermoid epitheliomas which have a rather marked degree of radiosensitivity.

The author observed the case of a fifty six year old man whose condition differed from the ordinary in that he presented a primary cancer of the esophagus with cutaneous metastases. The radiosensitivity of the cutaneous lesion was very low and was of the same order as that of the primary lesion.

When seen at the clinic the patient presented a nearly complete dysphagia, epigastric and retrosternal pain and an extreme asthenia. In the course of the last month he had developed an inguinal adenopathy at the left side. On the external aspect of the right leg a small painless nodule developed which progressively became ulcerated and gave rise to an oval shaped ulcer whose long axis was directed vertically. The ulcer showed a necrotic base and its margins were raised and indurated.

On histological examination the primary esophageal tumor was diagnosed as an epidermoid squamous epithelioma. A biopsy taken from the cutaneous metastasis revealed a malignant spinocellular epithelioma or squamous cell epithelioma.

The cutaneous lesion and the inguinal adenopathy were irradiated for a period of nearly two weeks with penetrating rays of 200 kilovolts with a filtration of 1 mm copper and 2 mm aluminum. The total dose per field was 2 500 r with individual doses of from 200 to 250 r per field.

About ten days later an improvement was noted and as the results were encouraging the primary tumor was irradiated with a total of 3 000 r in the anterior field and 2 000 r in the posterior field at an average of 300 r per day. This treatment was followed by no appreciable clinical improvement.

Two subsequent biopsies taken from the cutaneous lesion revealed at first a hyperplasia of the

connective tissue and a marked increase of keratinization. At a later stage the keratin seemed to disappear gradually and the tumor cells appeared to aggregate in clusters.

The author concludes that cancer of the esophagus in the course of its evolution infiltrates the surrounding tissue and the retrotracheobronchial lymph nodes. Metastases usually occur in the liver, lungs, and bones. Cutaneous metastases and inguinal adenopathy have so far not been reported. The type of tumor is almost always a basal-cell or squamous-cell epithelioma.

Radium therapy applied intra-esophageally offers at most temporary relief, and is usually of no great avail because of the rapid extension of the tumor and the impossibility of accurate determination of the extent of the lesion. Also, it is almost impossible to irradiate uniformly, and difficult to prevent irradiation necroses in the mediastinum.

RICHARD E. SOMMA, M.D.

Guisez, J.: Cancer of the Esophagus Treated with Radium Therapy. Recurrence in Twenty-Six Years (Cancer de l'œsophage traité par la radium-thérapie. Récidive au bout de vingt-six ans) *Bull. et mêm. Soc. d. chirurgiens de Par.*, 1936, 28, 564.

Guisez observed in 1910 a sixty-two-year-old physician who entered the hospital with complete dysphagia of several days' duration. Antispasmodics had been of no avail. The patient was found to be markedly dehydrated and in a severe state of malnutrition.

On examination of the esophagus the upper portion of the tube was found to be dilated and to contain residual food. Lower down, the esophagus was stenosed, and disintegrating masses were resting on an indurated base. On slightest contact a profuse hemorrhage was produced which proved conclusively the presence of an epithelioma.

Following careful dilatation with esophageal bougies, radium therapy was instituted. Fifteen milligrams of radium were used. Six exposures of from five to six hours each were made at intervals of one or two days. Five days following the last exposure the patient's condition had improved remarkably so that he was able to swallow food in sufficient quantity. Deglutition improved gradually, and he resumed his activities as a physician.

Nothing was heard about the patient up to the present time when he suddenly returned to the hospital with a complete dysphagia. On examination the neoplasm was found to be present at the same place where it had developed before.

In the author's opinion, contact bleeding associated with the presence of disintegrating masses resting on an infiltrated base constitute a sure sign of the presence of malignancy. The author believes that the radium tubes may be kept in the proper place without danger of displacement during exposure only by means of a long sound. It is necessary to embed the radium in adequate platinum containers in order to prevent secondary burns.

Treatment should be fractional, and the author believes that exposures should be made daily over periods of from five to six hours each up to a total of from twelve to fourteen treatments. The radium applications should be made endoscopically to insure correct placing of the radium. Usually the patient feels encouraged after a few treatments because swallowing soon becomes easier. Better results are obtained with the circular types of the tumor than with the unilateral forms. Vegetating and fungating lesions are more radiosensitive than submucous and infiltrating lesions. Basicellular types are more amenable to radium therapy than spinocellular, squamous, types.

Biopsies are made more easily in the vegetating forms of carcinoma than in the submucous, infiltrating types. In early lesions a biopsy is definitely contra-indicated. The author has resorted to biopsies in all cases in which it was practicable and not dangerous, but he admits that in cases in which a biopsy had been performed, the results obtained with treatment were less rapid and less satisfactory.

The differential diagnosis of cancer of the esophagus includes primarily syphilis and tuberculosis of the esophagus. Usually no difficulties are encountered in making a diagnosis.

In a subsequent discussion of this subject most of the participants agreed that in cases of esophageal malignancy biopsies are especially dangerous and should not be performed. RICHARD E. SOMMA, M.D.

Furstenberg, A. C., and Yglesias, L.: Mediastinitis: A Clinical Study with Practical Anatomical Considerations of the Neck and Mediastinum. *Arch. Otolaryngol.*, 1937, 25, 539.

The authors studied the fascial spaces of the cervix and mediastinum by gross dissection, sagittal sections, and human embryonic sections. As a result of these observations they came to the following conclusions:

Suppurations below the fourth thoracic vertebra are preferably approached and drained by dorsal mediastonotomy. Cervical mediastonotomy is a far more conservative measure, and often serves admirably to drain infections in the upper portion of the mediastinum. When pus enters the mediastinum from the neck, the latter procedure is the one of choice.

The technique of cervical mediastonotomy is described. The incision is placed on the right side because the right compartment of the mediastinum is larger, contains more lymphatics, and is the site of predilection for inflammatory processes in this region. The right side is also preferred when it is possible to give adequate drainage, as the left side of the esophagus lies in closer relation to the pleura as it enters the thoracic cavity than the right side. An incision from 5 to 6 cm. long is made over the anterior margin of the right sternocleidomastoid muscle down to the suprasternal notch. The sternocleidomastoid, sternohyoid, and sternothyroid muscles, together with the contents of the carotid

sheath, are retracted laterally which retraction exposes the trachea and at a deeper level the esophagus. If it is necessary to elevate the right lobe of the thyroid care must be exercised not to injure the inferior thyroid artery. By blunt dissection the anterior or posterior mediastinal space, depending on the location of the exudate is entered. A drainage tube is inserted, and negative pressure is applied at frequent intervals. Postural drainage may be of advantage at times.

EARL O. LATIMER, M.D.

MISCELLANEOUS

Kaiser, G. The Clinical Picture of Hiatus Hernia.
(Das klinische Bild der Hiatushernie) *Arch f. Verdauungskr.* 1936 60 51.

Many complaints which up to the present have been without explanation, as for instance violent attacks of angina pectoris, can be traced back to hernial dilatation of the esophagogastric tract inside of the diaphragm slit, i.e. hiatus hernia. The trouble usually proceeds from the stomach, as from pressure under the sternum, frequent regurgitation, or heart burn, or it is a question of oppressive tension in the lowest part of the esophagus and in the first part of the stomach whereby the vagus nerve is irritated. After many recurrences of the attacks the musculature is damaged on account of the decrease of blood in the coronary vessels. The roentgen film is of great help. The treatment is not very promising as the sufferers are usually people over sixty years of age, yet no case of bleeding to death has been observed. Of 126 patients observed by

the author, 35 patients with hiatus hernia were free from complaints, 29 revealed other serious diseases upon examination and 62 presented only the hiatus hernia as the cause for the complaints. As the esophagus in the slit is attached like connective tissue but is not quite stationary it is possible that part of the stomach is depressed upward. Most of the time there is a dilatation of the esophagus above the diaphragm with more or less strong attacks of a sensation of fullness.

Frequently the patient obtains immediate relief by breathing deeply, by stretching, by regurgitating, also artificially by taking sodium bicarbonate. Often, however, the attacks turn out to be true angina pectoris. The author illustrates the variety of complaints by giving several histories of the disease and calls attention to the similarity of the symptoms to those of biliary colic, gastric crises, inflammation of the intercostal nerves, cancer and ulcers of the stomach, liver contraction with venous dilatation in the esophagus, thyrotoxicoses and stomach cramps. The gastric juice is not strongly acid. Frequently there is an inflammation of the gastric mucous membrane. The extent of the complaints seems to be independent of the extent of the hernia. It is more important to determine whether strangulation will result. This is often brought on by chronic constipation, ascites of long standing, obesity, chronic cough and a sudden strong increase in the pressure in the abdomen, as for instance from an accident or violent vomiting and on account of age. In advanced age the esophagus becomes somewhat looser in the slit of the diaphragm.

(EGERT) CLARENCE C. REED, M.D.

SURGERY OF THE ABDOMEN

GASTRO-INTESTINAL TRACT

Tolboll, E.: A Case of Volvulus Ventriculi Totalis (Ein Fall von Volvulus ventriculi totalis) *Hosp Tid*, 1937, p 14

Volvulus of the stomach is a great rarity. In 1922 Weiss found only thirty cases in the literature covering a period of sixty years. The rotation axis between the pylorus and the cardia, the long axis, is to be differentiated from the rotation axis between the greater and lesser curvature of the stomach, the transverse axis. The rotation may be a total of 180, or only a partial one. The latter occurs in gastric or perigastric lesions, such as ulcer, scar-tissue adhesions, and diaphragmatic hernias. Predisposing causes of total volvulus are hypermotility of the stomach and gastropnoia. By far the most cases of volvulus occur in adults of forty years and over; although two cases were observed in children of two and five years by von Siegel and Dujon.

The symptoms of a total volvulus are those of a high bowel obstruction, and the symptoms of a partial obstruction are less severe and consist chiefly of pains and digestive disturbances. Of the known thirty-four cases only five were correctly diagnosed and operated. The diagnosis depends upon the following important and characteristic signs. The vomitus is watery, never biliary nor fecal, and ceases shortly. It is followed by emesis of mucus out of the esophagus. At the same time, it is impossible for the patient to ingest even the least amount of nourishment. Complete closure of the cardia makes it impossible to pass a sound. Roentgen plates cannot be made as no contrast material can be swallowed. The author reports a case of a previously healthy forty-three-year-old woman who had nine normal deliveries. She was very suddenly seized with symptoms of bowel obstruction. Palpation over the epigastrium revealed a tumor filled with watery contents. After seven days a laparotomy was done without confirming the diagnosis. There was a complete rotation of the stomach, the greater curvature being above and the lesser below the long axis of the stomach and, besides, a transverse rotation which placed the cardia below and to the right and the pylorus above and to the left. Replacing the organ was easy, but in two hours the woman died in collapse. (PORT) MATHIAS J SEIFERT, M D

Hunt, V C.: Benign Tumors of the Stomach *Surgery*, 1937, 1 711

Statistics obtained from the literature show that tumors arising from the muscular structure of the gastric wall comprise 60 per cent of all benign tumors, while those of epithelial origin make up an additional 30 per cent. A perusal of the literature shows that benign tumors of gastric origin make up from 0.5 to 5 per cent of all gastric neoplasms.

Most benign tumors of the stomach are symptomless, but when symptoms occur they may be bizarre or suggestive of peptic ulcer, and possibly they may be complicated by hemorrhage or intermittent pyloric obstruction. Anemia in these cases sometimes presents a blood picture simulating that of pernicious anemia. Peptic ulcer has been found present in a high percentage of cases of benign tumor of the stomach.

The author presents two cases. In the first the symptoms were characteristic of peptic ulcer complicated by one massive and several small hemorrhages. Hemorrhage recurred six months later. The hemoglobin was 45 per cent, and the erythrocytes numbered 3,340,000. Roentgenological examination of the stomach revealed a niche on the greater curvature of the stomach. At operation a tumor 9 by 4 by 4 cm. was removed and partial gastrectomy was performed. The diagnosis was leiomyoma and peptic ulcer.

The second case reported gave a history of weakness and anemia for thirteen years with occasional gastric disturbances. A diagnosis of pernicious anemia had been made elsewhere. The hemoglobin was 37 per cent and the erythrocytes numbered 1,690,000. The patient's general condition was built up and at operation several tumors were palpable in the stomach. A large tumor was removed by sleeve resection and several others by local excision. The diagnosis was polyposis of the stomach with early malignant degeneration.

In approximately 60 per cent of the cases in which operations have been performed, the tumor was removed by partial gastrectomy, and in a smaller number of cases by sleeve resection and local transgastric excision.

The value of early diagnosis of benign tumors of the stomach is stressed. These tumors are readily accessible and may be removed easily. It must be kept in mind that it is impossible to tell whether the tumor is benign or malignant except by direct examination. RICHARD J BENNETT, JR., M D.

Balfour, D C.: Factors of Significance in the Prognosis of Cancer of the Stomach *Ann Surg*, 1937, 105 733

The curability of cancer of the stomach by surgical removal of the growth has been well established. When the growth and the regional lymph nodes can be thoroughly extirpated, five-year cures occur in about 30 per cent of the cases. This figure is based on 18 per cent of five-year cures when the lymph nodes are involved, and 48 per cent of five-year cures when they are not involved. In view of the absolute hopelessness of the disease when treated by any other method, the importance of developing every means of recognition while the growth can yet be removed should be emphasized.

Accuracy in the prognosis of disease is properly interpreted by the layman as an evidence of professional experience and knowledge. When the condition is inoperable, any information which can be given as to the expectation of life, the nature of the symptoms which probably will mark the course of the disease, and what can be expected from the treatment of these symptoms is most gratefully received. Also in those cases in which the growth can be removed or some palliative procedure can be carried out, the family should be informed of the facts on which the prognosis is based.

The findings reported here, as related to the prognosis, are based on a series of 4,793 cases of gastric carcinoma in which operation was performed at The Mayo Clinic in the period from 1906 to 1931. In 2,112 of these cases the growth could be removed either for palliation or in the hope of cure. The expectation of life in the group in which exploration revealed the disease too advanced for either gastric resection or gastro-enterostomy was five months. In the group in which gastro-enterostomy was performed, the expectation of life was only one month more or six months, and the mortality relative to the operation was 12 per cent.

In the cases in which the growth was removed, the hospital mortality was 13.9 per cent. A low mortality is chiefly dependent on proper preparation of the patient for operation and meticulous attention to all those details which lessen the likelihood of development of the two chief causes of death in such cases, namely peritonitis and pneumonia.

Many factors may be taken into consideration in estimating the prognosis when the growth can be extirpated, namely: the age of the patient, the duration of the symptoms, the gastric acidity, the size, situation, and extension of the lesion into the omentum and lymph nodes, and the pathological characteristics. Although some of these factors prove to be of little significance, they are at least interesting and contribute to a better knowledge of the basis of prognosis.

In so far as age is concerned, it was shown in this series that the percentage of five-year survival in the disease was higher among the older patients, 33 per cent in the age group from forty-five to fifty-four years, as contrasted with 25 per cent in the group from thirty-five to forty-four years old.

The length of history disclosed the interesting fact that five-year survivals were more frequent among those cases in which gastric symptoms were of longer duration, for of the patients whose symptoms had been present for twelve months or more, 35 per cent lived five years, while of those whose symptoms had been present for six months or less, 25 per cent were alive and apparently well at the end of five years.

The investigation of survival based on the size of the lesion disclosed the curious fact that there was greater expectation of life among patients who had the larger lesions than among those who had the smaller lesions. This is probably attributable to the fact that the smaller lesions are more likely to be of

a penetrating character and also of a higher degree of malignancy than the larger lesions.

The situation of the lesion is of significance and in this series the observations of others are confirmed. The observations referred to are, namely: that the nearer the lesion is to the pylorus, the more difficult it is to cure, and that removable lesions in the body of the stomach are accompanied by a distinctly higher rate of survival (40 per cent) than those near or involving the pylorus (28 per cent). This may be attributable to the fact that regional lymphatic structures are more easily removed with thoroughness when they are in the former situation than in the latter, and also to the fact that not enough attention has been given to the importance of removing a segment of the first portion of the duodenum. It has been shown that although gross involvement of the duodenum is exceedingly rare in cases of cancer of the stomach, microscopic invasion can be demonstrated quite frequently.

The extension of the lesion has great significance in the prognosis. Five years after operation for cancer of the stomach, as has been noted earlier, 15 per cent of the patients whose lymph nodes are involved and 48 per cent of those whose lymph nodes are not involved are alive. The difference is 30 per cent.

The most accurate prognostic information obtainable in this series proved to be the grading of malignancy by the method of Broders, in which the degree of cellular differentiation is recorded as of Grades 1, 2, 3, and 4. Of the patients with carcinoma of Grade 1 or 2, 63 per cent were alive five years after operation, and 55 per cent were alive ten years after operation. Of the patients with carcinoma of Grade 3 or 4, only 20 per cent were alive five years after operation. These results again substantiate the fact that grading of malignancy is of first importance in the prognosis.

The coordination of these various factors added definitely to the accuracy in prognosis at the Clinic. Also this investigation has supported the contention of surgeons that the surgical treatment of cancer of the stomach can and does accomplish more than is recognized, and that constant reference to this fact is the best means of effecting earlier recognition of the disease.

Bracci U. Sarcoma of the Stomach (II sarcoma gastrica). Ann. ital. di chir. 1937, 16, 1.

Bracci gives a clinical and autopsy report of the single case of sarcoma of the stomach observed at the Royal Surgical Clinic in Rome between 1919 and 1936. Two hundred and seventy cancers of the stomach were operated on during the same period. The patient was a woman fifty years old who was first seen four months after the beginning of the symptoms, epigastric pain and progressive emaciation and weakness. Two weeks after the onset she noticed a nodule in the right axilla which gradually increased to the size of a mandarin. On admission there was a palpable mass in the epigastrium and

radiological examination revealed a stenosis in the descending portion of the stomach. Biopsy on an axillary gland showed a small round-cell sarcoma. The patient had repeated hematemesis and died within two weeks. At autopsy a huge ulcerated tumor was found on the lesser curvature. There were metastases to the mesenteric and retroperitoneal glands and the right adrenal gland.

The author gives a general review of sarcoma of the stomach, including statistical and historical facts, and discusses the classification, pathology, symptomatology, clinical and radiological diagnosis, and treatment.

The article is accompanied by photographs and an extensive bibliography.

M. E. MORSE, M.D.

Hejduk, B.: Two Interesting Cases of Acute Bowel Obstruction in Carcinoma of the Small Intestine (Zwei interessante Fälle von akutem Darmverschluss bei Carcinom des Dünndarmes). *Zentralbl. f. Chir.*, 1937, p. 295.

Primary carcinoma of the small intestine is very unusual, up to date about 88 cases have been published. The disease generally develops during the course of chronic bowel obstruction.

The two new cases reported are especially noteworthy because the bowel obstruction occurred very suddenly without any preceding symptoms of cancer. In the first case, that of a sixty-three-year-old man, the obstruction resulted suddenly from the lodging of a piece of undigested beef fascia, which he had eaten the day before, in a part of the bowel narrowed by cancer. In the second case, that of a forty-nine-year-old man, the obstruction followed gastric resection for benign pyloric stenosis. A second laparotomy revealed a narrowing of the efferent loop of the bowel due to carcinoma. The obstruction resulted from the greater amount of food passing into the intestines after the gastric resection. After resection both patients recovered. In the first case, unfortunately, metastases followed in one and one-half years. Histologically, both neoplasms proved to be adeno-carcinoma.

(LEHRNBECHER) MATTHIAS J. SEIFERT, M.D.

Mnuchin, N.: Acute External Duodenal Fistulas (Die akute äussere Duodenalfistel). 1936 Leipzig, Dissertation.

To the 96 cases of external duodenal fistula reported by Kittelson in 1933, the author adds 67 from the literature, and 9 from the Payr Clinic in Leipzig. This makes a total of 172 cases.

In evaluating the rôle of drainage of the peritoneal cavity as a cause of this condition, the author found that tamponade or drainage had been performed in 55 per cent of the cases, and although no mention was made of drainage in the remaining 45 per cent, it surely must have been used in a large number. According to Horsley a tampon is dangerous because it prevents healing and union by sucking out the lymph. There are three factors responsible for

fistula formation: (1) inadequate closure, (2) necrosis from mass ligation, damage to adjacent structures; (3) leakage, or perforations which had not been closed. These three causes have a 3:2:1 relationship.

Of the 9 cases comprising the author's series, 1 occurred in a patient with duodenal ulcer; 2 were secondary to perforation of a duodenal ulcer, another followed separation of the suture line, and 5 occurred in patients with gastric carcinoma. Surgical intervention consisted of gastro-enterostomy with pyloric exclusion in 6 cases, and gastro-enterostomy and closure of the fistula in 2 cases, tamponade alone was employed in another case which presented a subphrenic abscess without demonstrable suppuration, but with evident secretion and leakage of gastric juice.

In a group of 143 cases the fistula manifested itself during the first week in 84, between the second and third week in 35, and between the third and sixth week in 17. The critical time for appearance of the fistula was between the third and fifth postoperative day. The marked loss of duodenal secretion occurs because the pylorus remains persistently patent on account of inadequate reflex closure.

There is much in favor of the theory of Barsony and Hortobágyi, who believe that the cause for fluid loss lies in muscular depression of the gastric motor nerves. They explain the effect of the duodenal fistula on the flow of secretion, as a persistent irritation which initiates hyperstalsis above the fistula. The chemical pathology is also adequately discussed and clearly explained.

The prognosis is grave as a rule. The mortality is 37 per cent, but it has improved markedly within recent years. The prognosis is especially bad after rupture of the duodenum and duodenal ulcer.

Conservative therapy consists in preventing or limiting the out-pouring of the secretion. This can be achieved by radical limitation of food taken by mouth, or by establishing a functioning gastro-enterostomy, a procedure used in Leipzig, which makes feeding by mouth possible. The importance of protecting the skin, proper nutrition, and prevention of toxemia by the generous administration of chlorides is emphasized.

The statistical results comprise 209 attempts at cure in 172 patients with success in 62 per cent. Fifty-seven patients were treated surgically and 152 conservatively, surgical therapy resulted in cure in 44 per cent, and the conservative measures in 67 per cent. Therefore, the latter are the author's choice.

The chemistry of the blood and urine should be watched daily. Every patient should receive large quantities of salt solution and dextrose. The loss of chlorides should be decreased with atropine, and the pancreatic secretion should be reduced with insulin. An attempt to introduce a duodenal sound should be made, and when this cannot be done a jejunostomy is indicated. The fistula should be treated by the Puffer method, as described by Potts. A gauze tampon saturated with one-tenth normal hydro-

chlolic acid and a tampon containing beef extracts and olive oil should be used. The skin over the fistula should be drawn together with adhesive tape.

Surgical therapy should be secondary to the conservative measures.

(ENDRE MAKAI) SAMUEL J. FOGELSON M.D.

Colbeck J. C. Hurst A. F. and Lintott G. A. M. Regional Ileitis (Crohn's Disease). *Guy's Hosp. Rep. Lond.* 1937 87 175

A case of regional ileitis which was first described by Crohn and subsequently became more widely known under the name of Crohn's disease is described together with the pathological and bacteriological findings. The latter indicate that the condition is not tuberculous. A second case in which recovery followed short circuiting without excision is also described.

The symptoms of the disease are briefly discussed. In view of the present lack of knowledge concerning the cause of this condition a reasonably restricted conception of Crohn's disease and of the grounds on which such a diagnosis can justifiably be made should be maintained. Even with the application of certain definite circumscribed diagnostic criteria the condition is by no means a rarity.

The good prognosis resulting from suitable treatment is emphasized.

SAMUEL KAHN M.D.

Pemberton J. deJ. and Brown P. W. Regional Ileitis. *Ann. Surg.* 1937 105 855

There are two clinical types of regional enteritis: (1) the involvement of a rather short, localized segment which usually consists of a single lesion, and (2) a similar process which involves longer segments and usually consists of multiple lesions. Pathologically both types differ grossly in extent, but microscopically both are associated with the same granulomatous process and tend to destroy all the intestinal walls to cause stricture and not uncommonly tend to cause adhesions to the adjacent bowel and produce fistulous formation.

Etiologically there is as yet no final agreement. The first query always is: Are you sure it is not tuberculo? To the best of knowledge this particular lesion is not tuberculous. Repeated sections have been stained for the tubercle bacillus and in several of the authors' cases as well as those reported by others guinea pigs have been inoculated but there has not been any evidence of tuberculosis.

Clinically ulcerative colitis and regional enteritis are similar. In both there is usually the history of early exacerbations and remissions. As time goes on the disease becomes more continuous and more resistant to treatment.

The authors have seen both the acute and chronic stages of inflammation of the small bowel. In some cases the appendix was chronically inflamed and in others it was acutely inflamed. Appendicectomy was the only operation performed in these cases.

The authors have selected only the cases in which lesions originated in the small intestine and were not

associated with true ulcerative colitis or with primary granuloma of the cecum. Whenever there has been doubt as to the presence of intestinal tuberculosis even though the positive evidence was very scanty such a case has been omitted from this study. Likewise the authors have not included that small but most interesting group of solitary ilial ulcers and ulcers of Meckel's diverticulum reported previously.

Adhering to rigid selections, this report comprises 39 cases observed at the clinic from 1922 to date. The presence of the lesion was established by operation or necropsy. Thirty-six patients were subjected to operation at the clinic and 3 were operated upon elsewhere. One patient died without being subjected to operation.

The age distribution parallels that found in a series of cases of ulcerative colitis, in which 29 of the 39 patients were less than forty years of age. This probably is merely indicative that the more active lymphoid tissue of young people is an important predisposing factor in any inflammatory disease. The sex factor was not significant in the cases of regional ileitis as 23 of the patients were males and 16 were females.

In the 3 cases in which the jejunum only was involved the involvement was extensive. The ileum was involved in 34 cases. There were 2 cases of multiple involvement or 'skip areas' throughout much of the small bowel.

Grossly the lesion consists of an inflammatory process which is rather sharply localized to a single segment of bowel, but occasionally involves two or more segments that apparently are separated by intervening segments of normal bowel. In the more active phase the involved segment is greatly swollen, heavy and reddened. In the more chronic phase of the disease marked edema, engorgement and exudate have disappeared to a large degree, but the intestinal wall is still greatly thickened. It feels leathery and in most instances is free of adhesions.

Pain which is the outstanding feature of the disease was present in 38 of the 39 cases. Efforts to localize the lesion by the distribution of the pain are helpful in only one respect, that is, the pain is more likely to be situated below the umbilicus than above it.

Fever which often was associated with chills occurred in 21 cases and no doubt occurred in others. Secondary anemia occurred in 17 cases. In 1 case in this series tarry stools were associated with the attacks of pain and fever.

In this series of cases nausea and vomiting frequently were associated with the attack and in many instances they had led to an unsuccessful operation. There were no significant changes in the blood although a macrocytosis was noted in some cases, but this could be considered only a suggestive sign.

A typical pathognomonic clinical syndrome of regional enteritis has not been elaborated; in fact the clinical diagnosis remains conjectural or tentative.

tive until roentgenological evidence of the disease is added

The fact that 26 of these 39 patients had undergone one and often more unsuccessful operations for this disease is evidence of its seriousness, as is the fact that in the past the disease has remained unrecognized even after laparotomy.

The treatment of regional ileitis is essentially surgical and usually necessitates removal of the diseased segment with reestablishment of the continuity of the intestinal tract. The operation may be performed in one or two stages. In a large proportion of the cases the disease is complicated by obstruction, by acute or subacute inflammatory changes, or by the presence of abscesses or intestinal fistulas when the patients are seen by a surgeon.

Although six of the eight patients who were subjected only to the first stage of the procedure, ileocolostomy, for localized enteritis reported that they were well and free of symptoms for from two to five years after operation, the authors believe that resection of the involved portion of the bowel is indicated in all cases in order to prevent the spread of the infection. In one case in which the patient delayed returning for the second stage, resection, for four years, a recurrence of the process was discovered in a short localized segment of ileum at the site of the previous end-to-side ileocolostomy.

The authors think that the interval between the stages of the procedure should be varied, and should depend chiefly on the general condition of the patient and the nature of the complicating lesion. In no instance have the authors seen any progress of the disease occur between the first and second stages when the interval did not exceed six months, but on the contrary there has been without exception a very marked subsidence of the inflammation which greatly facilitated resection.

Surgical treatment was employed in 36 cases. Data are available in 35 of the 36 cases in which operation was performed. Twenty-two patients are apparently well, 1 is in fair health, and 6 are not well. Two deaths occurred in the hospital, and 4 patients died after they returned home. The immediate surgical mortality was 2 or 5.5 per cent. In these 36 cases, 47 major surgical procedures were carried out with a mortality of 4.2 per cent.

In three cases in which only a short-circuiting operation was performed, a deficiency syndrome with the hematological picture of primary anemia has developed. It is impossible to say whether or not this syndrome is related to the ileitis. All of the deficiencies are being controlled by liver. In another case a deficiency disturbance, comparable to the wet type of beriberi, developed after the operation. This disturbance cleared up promptly as a result of a normal diet plus Vitamin B.

Perman, E.: Appendicitis in Children (Appendicitis bei Kindern). *Acta chirurg Scand*, 1937, 79: 359.

The author reports 590 cases of appendicitis in children, 151 of which were associated with peri-

tonitis. Of the latter 16 (10.6 per cent) terminated fatally. A comparison with appendicitis occurring in adults shows that severe appendicitis is more common in children. The condition develops more rapidly, and free peritonitis and perforation occur more often. The capacity of a child to overcome peritonitis is relatively good. If this were not true the mortality would be much higher than it is in view of the many severe cases which occur.

In the diagnosis of an intra-abdominal abscess in which the roentgen orientation picture does not provide definite evidence, very valuable information can be obtained from a cystogram. An abscess reveals itself as a defect in the bladder shadow.

At the onset of the condition the stools are often normal, or they may be diarrheic. There was constipation in only one-third of the cases. When diarrhea with marked symptoms of appendicitis is present, the condition is usually far advanced.

Suzuki, S.: Histobacterioscopic Examination in Acute Gangrenous Appendicitis (Histobakterioskopische Untersuchung akuter gangraenöser Wurmfortsatzentzündung). *Mill d Path*, 1936, 9: 49.

Seventy gangrenous appendices obtained by operation were examined bacteriologically and histologically by the author. At the same time 17 normal appendices, as well as appendices obtained in early or interval operations, were examined as controls. The contents were examined bacteriologically, and sections were examined bacterioscopically by means of Gram's coloring matter and the silver impregnation method of Levaditi. In all gangrenous appendices, edema, hemorrhage, cell infiltration and tissue necrosis were found to be more or less pronounced, and occasionally severe necrosis of the lumen with perforation was observed. The gangrenous process was least pronounced at the base of the appendix and most pronounced at the tip. Bacteriologically the contents of the appendix yielded many typical and atypical colon bacilli, and in individual cases, enterococci, pyocyanus bacilli, staphylococci, and in one case a type of anaerobe were found in culture. Colon bacilli, enterococci, or proteus bacilli, as well as anaerobic organisms were observed generally also. Bacterioscopically many different types of bacteria were obtained from the necrotic layer of mucosa and submucosa lying near the lumen. There were long and short rods with Gram-positive coloring, and a few Gram-positive monococci, streptococci-like cocci, Gram-positive diplococci, and other microorganisms. In the deeper structures of the appendix wall the variety and number of bacteria decreases. In the muscularis and subserosa only a few Gram-positive diplococci and monococci and short rods were found. In the non-gangrenous appendices only monococci and diplococci were observed. The bacterioscopic findings were not always parallel with the degree of histological changes. Only in extensive necrosis many different bacteria entered the deeper structures. From the findings in early gangrenous

as well as phlegmonous appendicitis it was observed that ulcerative processes epithelial defects, or necrosis must be present in order that the bacteria in the lumen can enter into the deeper tissues

(HALMANN) WILLIAM C BECK MD

Hurst A F and Knott F A Regional Colitis
Guys Hosp Rep Lond 1937 87 187

Regional colitis may be regarded as a form of ulcerative colitis in which the disease is localized to a single segment of the colon. The rectum and lower part of the pelvic colon are not involved. It was first described as a clinical entity by Bargen and Weber in 1930 and so far as the author is aware no other article has appeared in the literature on this particular subject. Bargen and Weber described 22 cases in which there was no sigmoidoscopic evidence of ulcerative colitis although the patients had characteristic symptoms. An opaque enema showed that ulcerative colitis was present in an isolated segment of the proximal colon. The diagnosis was confirmed by laparotomy in 11 patients and by autopsy in 3 patients.

A case of regional ulcerative colitis associated with bacillus asiaticus was cured by partial colectomy. A medical man, age forty one years had had his lateral pulmonary tuberculosis at the age of twenty years. He recovered and was able to take care of a large general practice. In February 1935 he felt very tired and had an attack of colic and diarrhea with the passage of blood in the bowel movements. This condition persisted for three months. Severe colicky pains recurred in the left side of the abdomen and the bowel movements were attended with great pain. A carcinoma of the colon was suspected but sigmoidoscopy was negative. By September 1936 he was passing six stools per day. There was much blood present. Abdominal pain was severe in the left lower abdomen. He vomited when forced to eat solid foods. The descending and iliac colon could be felt as a hard cord. The blood count was nearly normal and he had no fever. An opaque meal revealed a normal colon as far as the splenic flexure where there appeared to be a considerable degree of obstruction the result of spasm. The typical appearance of severe polypoid ulcerative colitis was clearly visible in the entire descending and iliac colon. In addition to the usual bacillus coli communis and the enterococcus the stools contained large numbers of a non lactose fermenter which proved to be bacillus asiaticus. It was agglutinated by the patient's serum in a dilution of 1 to 50. No tubercle bacilli could be found on repeated examination.

A diagnosis of regional colitis was made and laparotomy performed. Jones removed the colon from a point in the transverse colon 5 in. from the splenic flexure to a point in the pelvic colon 3 in. from the junction with the iliac colon. An end to end anastomosis was made together with a temporary cecostomy. Recovery was uneventful and by October the patient was feeling very well. His stools were normal and no occult blood was present. Re-

peated cultivations of the stools showed the absence of bacillus asiaticus.

Microscopic examination of the excised portion of the colon showed a severe inflammation but no evidence of tuberculosis. Some polyps were present which were true adenomas but others were pseudo-polyps or tags of simple hypertrophic mucous membrane separated from the intestinal wall by the ulcerative process. At the base of these tag ulceration persisted in some areas in others healing had taken place.

JOHN W NORTON MD

Bowling H H and Fricke R E The Technique of Radium Treatment of Carcinoma of the Rectum
Radiology 1937 28 521

A review of the 132 cases in this series of patients with carcinoma of the rectum who were first referred for radium therapy at The Mayo Clinic during 1934 indicated that most of the patients were in the advanced age group their average age being fifty eight years. Other degenerative diseases were present in many cases and the life expectancy was not high. In the majority of the cases the lesion was inoperable as a result of its extent and fixation or because of metastases.

Radical or aggressive radium therapy was employed in twelve cases and consisted of interstitial treatment with radon seeds or radium element needles with or without the aid of surgical diathermy. This treatment was also used as a pre-operative measure and radical excision of the growth was carried out later. Contact treatment was given with two tubes strapped together to form a plaque which plaque was maintained securely against the lesion by rectal packing. This treatment was employed in eighty nine cases. Daily treatments were given until the entire surface of the lesion was irradiated. Another method of attack in the case of small lesions was destruction of the growth by fulguration followed immediately by the contact method of treatment. Patients treated in this manner should be reexamined every three months and further treatment given if necessary.

Conservative or limited treatment was used in the remaining thirty one cases in this series. In the cases the lesion was advanced and inoperable and palliation was all that was intended. The technique consisted of external irradiation with either radium at a distance or roentgen rays. Telerradium was employed over the lymph nodes of the groins. heavily filtered tubes were placed in the center of annular growths and additional vaginal applications were employed for female patients.

Radium is a very flexible agent and treatment can be applied in a variety of ways. Each patient must be studied carefully and the intent of treatment definitely established that is whether it is to be applied for cure or only for palliation. The technique differs. In the smaller group of cases showing a possibility of cure especially close cooperation with surgical treatment is indicated. Colostomy is optional but very valuable.

The treatment of carcinoma of the rectum presents obstacles not encountered in the treatment of malignant neoplasms in other organs. The treatment is necessarily tedious and involves extreme care and concentration, it cannot be done hurriedly, nor can it be standardized. The good results vary directly with the care and judgment exercised and with the experience of the physician in treating this intractable condition.

LIVER, GALL BLADDER, PANCREAS, AND SPLEEN

Martin, C L: Roentgenological Studies of the Liver and Spleen. *Am J. Roentgenol.*, 1937, 37 633

The studies of the author are based to a considerable extent on those of Pfahler, who has shown that good films made in an antero-posterior position with a 25-in target film distance usually outline the under border of the liver so that its shadow can be measured. He made use of two dimensions. The "length" of the liver was measured from the lower right edge to the highest point on the upper border of the right lobe. In a large series of normal individuals the average figure for this measurement was 21.3 cm, the lowest 18.0, and the highest 22.0. The other dimension was called the thickness or "width" of the liver and was measured from the highest point on the right lobe to the midportion of the lower border. The average width was 12.8 cm, the narrowest was 10.0 and the widest 14.0.

Unfortunately, the spleen is rarely visualized in ordinary films and its study requires the injection of thorium dioxide, which is a more specialized procedure.

Although pneumoperitoneum was popularized in this country by Stewart and Stein in 1919, the usefulness of the procedure was greatly augmented when Alvarez discovered in 1921 that carbon dioxide was safe for intraperitoneal injection. Not only can the size and shape of the liver and spleen be demonstrated, but adhesions about them can be outlined also. The procedure is of great value in studying the cause of unexplained ascites. However, despite the clear delineation of changes in the liver and spleen on the film, the determination of the underlying pathology is still quite difficult because such

a large number of diseases may produce these changes.

A marked reduction in the size of the liver is usually due either to acute yellow atrophy or atrophic cirrhosis. The liver in acute or subacute yellow atrophy is smooth in outline and shows a progressive decrease in size during the course of the disease. The cirrhotic liver is also much reduced in size, but its surface is usually irregular because of hobnail-like projections.

Another differential point is the degree of splenic enlargement revealed by the pneumoperitoneum studies. In acute yellow atrophy the spleen may show slight enlargement, but in atrophic cirrhosis the splenomegaly is quite pronounced.

The findings in ten cases of cirrhosis studied by pneumoperitoneum at Baylor University Hospital are tabulated. The diagnoses in these cases were made clinically by the medical department.

All degrees of hepatic enlargement can be demonstrated by pneumoperitoneum. Barron and Litman found in a study of 12,000 autopsies only 4 causes responsible for 58 very large livers, weighing 4,000 gm or more. In this series, 48 were produced by malignancy; 5 by melanoma, 2 by leukemia; 2 by amyloidosis, and 1 by Hodgkin's disease. The discovery of a very large liver should therefore always suggest the presence of carcinoma, unless the blood studies show the presence of leukemia or an adenopathy suggests the presence of Hodgkin's disease.

All of the very large livers must at some time have a moderate size, and the causes of great enlargement must also be considered as the causes of moderate enlargement. However, a large number of other conditions produce some hepatomegaly but never very large livers. Two such conditions are cardiac decompensation and acute infections, but both of these conditions are definitely contraindications to the use of pneumoperitoneum.

The author goes into an extensive discussion of the clinical and pathological aspects of enlargement of the spleen and liver. He concludes that pneumoperitoneum constitutes a valuable method for determining the size and identity of solid soft-tissue structures in the upper abdomen. It is obvious, however, that the method must be combined with other clinical procedures for the diagnosis of the chronic disorders which cause these changes in the liver and spleen.

HAROLD C. OCHSNER, M.D.

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and the specimen is taken by a gynecologist or pathological anatomist, not by a general practitioner. A positive diagnosis is certain, but a negative finding does not prove that the patient has no cancer.

AUDREY GOSS MORGAN, M D

Aron, M. The Biological Diagnosis of Cancer of the Cervix (Diagnostic biologique du cancer du col). *Rev. franç. de gynéc. et d'obst.*, 1937, 32: 198

The author emphasizes the fact that he is describing his method at this time chiefly for the purpose of getting other investigators to test it. It is a method of diagnosis for cancer in general.

It seemed probable to him that there were toxins in the urine in association with cancer. He demonstrated this fact by injecting an extract of the urine of patients with cancer into rabbits and showing that it produced changes in the suprarenal glands, which are very sensitive to toxins. As the objection was made that the histological picture of the suprarenal glands varies considerably even under normal conditions, he excised bits from the left gland and compared the findings with those after the injection of the urine extract. Having proved that there are such toxic substances in the urine of patients with cancer, his next step was to work out a biological reaction for the diagnosis of cancer, using the extract of urine as an antigen.

The urine extract used as an antigen is prepared from the urine of patients known to have cancer. It is precipitated first with 95% alcohol, three volumes of alcohol to one of urine. The precipitate is redissolved in physiological salt solution, about 100 c cm of salt solution to the extract from 1,000 c cm of urine, then shaken, and then the filtrate of the solution is re-precipitated with three times its volume of acetone. The precipitate obtained by centrifuging is dried in a vacuum, rubbed up in a mortar, and a 2 to 4 per cent solution is made of it with 8,100 salt solution. The filtered solution should be perfectly clear and remain so on being heated to 90° on a water bath. The blood serum to be examined, which has been separated from the blood by centrifuging, should be clear also. Sevenths cubic centimeters of the blood is added to 2 c cm of the urine extract in a test tube 13 mm. in diameter, and 0.3 c cm is placed in another. If enough serum is available, lower and higher concentrations, such as, 0.6 c cm and 0.9 c cm., should be used also. For each tube a control tube is used in which the 2 c cm of urine extract is heated to 90° for half an hour and refiltered if necessary. The mixture is homogenized by shaking and the tubes placed in the incubator at 38° for eighteen hours. A first reading is then made and the tubes left at laboratory temperature for from six to eight hours, when a second reading is made. If there is distinct turbidity with or without flocculation in the experimental tubes and the control tubes are clear the reaction is positive, if the experimental tubes as well as the control tubes remain clear or show only very slight turbidity it is negative.

This test proved positive in 124, or 80 per cent of 155 cases of cancer diagnosed clinically; doubtful in 22, or 14.2 per cent, and negative in 9, or 5.8 per cent. It was positive in 6, or 2.7 per cent of 222 non-cancerous cases; doubtful in 9, or 4 per cent; and negative in 207, or 93.2 per cent.

The method is not ready for practical use yet because of the very great variability in the urine extracts of patients with cancer. Until a standardized antigen can be produced, the test should be used with great caution. The author hopes for the collaboration of other workers in perfecting the test.

AUDREY G. MORGAN, M D

Hamant, A., and Chalnot, P.: Early Detection; Present Status of the Struggle Against Uterine Cancer (Le dépistage précoce; état actuel de la lutte contre le cancer utérin). *Rev. franç. de gynéc. et d'obst.*, 1937, 32: 186

Statistics collected by the authors in 1931 showed that on an average patients did not come for treatment of cancer of the uterus until five months after the disease had begun. The best means of overcoming this delay are by: (a) periodical examination; (b) greater effort on the part of physicians and medical personnel; (c) education of the public.

If periodical examinations were made it is believed that the majority of carcinomas, even those that do not cause symptoms, could be recognized early by the classical symptoms of leucorrhea and hemorrhage appearing after humoral changes in the tissues. Periodical examination would show the evolution of precancerous lesions, such as cervicitis and leucoplasia. Histological examinations of such lesions should be made periodically. Periodical examination may be repugnant to some women, particularly women of the working class who have to be examined before doctors and medical students. If the examinations could be made private they would be accepted much more readily. At least all women over forty years of age who come to hospitals for any disease should be examined for cancer. Such periodical examinations have been instituted in the United States for the women of the army. Since the publication of the circular recommending them, 8,824 women have been examined and 72 malignant tumors discovered. Periodical examination should be encouraged by the social insurance societies.

The individualistic and critical habit of mind of the French people has interfered with the general adoption of periodical examinations in that country. However, the general practitioner should be encouraged to make such examinations, and recommend them and explain their value to his patients. If the general practitioner detects suspicious symptoms and does not want to undertake the responsibility of treatment he can refer the patient to a specialist. Greater attention should be paid in medical schools to the technique of vaginal examination and the teaching of the latest methods of cancer diagnosis. The latest works on the subject such as

GYNECOLOGY

UTERUS

Palmitier K. A Large Cyst of the Uterus (Ene grosse Uteruszyste) *Acta obst et gynec Scand* 1937
17 105

An operation for sterility in a woman of thirty years revealed a stalked cyst formation larger than a man's head and proceeding from the fundus of the uterus. The thick stalk was fibromuscular, showing neither glands nor communication with the endometrium. The cysts lined with serosa contained water clear matter and presented a fibromuscular wall on the base and a more fibrous wall on the upper portion. The epithelium was basally cylindrical ciliated and in parts villously arranged. A small cyst pressed into a septum between the cysts was of particular interest. The lumen and epithelium of the cyst resembled those of the tube.

Several cases of uterine cysts analogous to the cysts present in this case are recorded with a view to clearing up their genesis. The author arrives at the conclusion that in all probability the cyst formation was developed from a budding of the interstitial portion of the tube during an early embryonal stage.

Hamant A and Chailot P. The Diagnosis of Cancer of the Cervix (Le diagnostic du cancer du col de l'uterus) *Rev franc de gynec et d'obst* 1937
32 109

In view of the great importance of making an early diagnosis in cancer of the uterus the author recommends systematic periodical examinations of women beyond a certain age particularly of any who seem predisposed to cancer of the uterus because of many deliveries or previous lesions of the cervix.

The classical texts generally describe only the late signs of cancer and the early ones are not as well known as they should be. The very earliest stages can be recognized only microscopically. At a somewhat later stage there is no palpable tumor and the cancer remains localized at its point of origin. When small tumors a few millimeters in diameter have developed the cancer is no longer early but has probably existed for some time.

The suspicious early signs are any irregular hemorrhage especially a slight red discharge following coitus an intermenstrual discharge in women who have not yet reached the menopause an atypical discharge at the time of the menopause or a discharge resembling beef juice after the menopause has begun. Vaginal examination in such cases may show a roughened cervix slight erosions or friable tissue which bleeds easily on a hard rigid background. Speculum examination confirms these findings. Franqué says that many cases can be detected before symptoms begin by finding an abnormal form of the cervix and a special hardness of the tissue.

Hinzelmann has constructed a special colposcope for examining the cervix by electric light. It enlarges the image the best enlargement being 10½ diameters. If the enlargement is greater than that it decreases the size of the field of vision. Because of the intense light and the enlargement the slightest lesions of the cervical mucous membrane can be examined carefully, such as irregularities of the surface erosions or ulcers papillary proliferations hyperkeratoses, and hyperemia or spots where changes in the epithelium have occurred. One of the most important findings is that of leukoplakia which is much more frequent than is generally believed and which is very frequently a precursor of cancer. However it is not specifically cancerous as it may be caused by inflammation or syphilis. Specimens should be taken from suspicious zones and examined histologically. If the woman is young and capable of child bearing and the lesions are apparently benign the case can be followed up and examinations made every six months on the slightest sign of cancerous degeneration the cervix should be amputated.

The Lahm Schiller test is made with iodine. The normal cervical mucous membrane contains glycogen and on the application of Lugol's solution turns dark brown. Glycogen is lacking in cancerous epithelium especially when it is young and the tissue remains white or pink. Ulcerations and erosions do not take the stain because they have no epithelial covering. They remain red. Gland epithelium does not take the stain, and therefore an ectropion of the intracervical mucous membrane remains red. However even non cancerous cornual degeneration of the mucous membrane whether inflammatory syphilitic or even simply irritative gives a positive test. Therefore the results of the test are not absolute and must be completed by biopsy. In making the test care must be taken not to injure the mucous membrane and remove the cells containing glycogen as this would give false results for the test. The hysteroscope may be used in the diagnosis of intracervical cancers. Its chief object is to obtain a biopsy specimen under the control of vision.

Hysteroscopy is a recent method of examination. A special diaphanous which is a 2½ per cent colloidal suspension of thorium flocculates on the mucous membrane and leaves a thin layer of thorium oxide which is opaque to the roentgen rays. The solution is introduced through a double return flow catheter as the object is to get a circulation of the fluid which will leave a deposit on the mucous membrane. A flow of from 4 or 5 c.c. of the fluid is enough after which the roentgenogram is taken.

The final diagnosis must be based on biopsy. There is not the danger of infection or dissemination that was once feared if the proper technique is used.

the indications have been decreased it has been reduced to from 2.66 to 9 per cent in the statistics from different countries. The mortality for vaginal hysterectomy is somewhat lower than that. Urinary complications are also much less frequent and less serious than they formerly were.

The statistics of eighteen authors are given, they show the results of surgery after five years or more. Statistics for a shorter period than that are of no value in cancer. The average number of cures for more than five years was more than 40 per cent, a figure that compares not unfavorably with that for radiotherapy. Vaginal hysterectomy is preferred in Vienna, but in France the preference is for the abdominal method. The author does not think the approach is of so much importance if radical removal of the glands is carried out. The surgeon who is a thorough master of one technique of hysterectomy should use it in preference to any other. The advantages of combining surgery with irradiation are now generally admitted. Pre-operative radium therapy is indicated particularly in cases with hemorrhage and discharge. Healing of the ulcer has the double advantage of stopping the discharge and preventing infections that might originate from the ulcer. Postoperative radium therapy is not in favor in France, but it is very much used in Vienna.

Operation is indicated in certain forms of tumor that are resistant to irradiation, such as, epitheliomas not of epidermal origin and epitheliomas with mucicarmunophile cells, also in cases of resistance to irradiation due to anatomical lesions or infections, and in cases in which insufficient irradiation has been given and the cancer has become radioresistant. In the last condition another attempt at irradiation would be almost a certain failure and would probably be aggravated by radionecrosis. Otherwise, surgery is indicated only in cases well within the limits of operability, cases of Class 1 and

2 of the Geneva classification, with a movable uterus.

AUDREY G. MORGAN, M.D.

ADNEXAL AND PERIUTERINE CONDITIONS

Mueller, G.: A New Report on Clinical Manifestations and Therapy of Ovarian Actinomycosis (Ein neuer Beitrag zur Kasuistik und Therapie der Ovarialaktinomykose). *Zentralbl. f. Chir.*, 1937, p. 243.

The author reports a third case of ovarian actinomycosis in addition to his two previously published.

The patient was a nullipara who had had ovarian inflammation for six years, and a recurrence in the past three years. The patient has been ill since March, 1934, with gastro-intestinal symptoms. In April the condition grew worse, with high fever, vomiting, diarrhea, pains in the lower abdomen, burning on urination, cystitis, thickening of the adnexa on both sides of the uterus, and infiltrations in the cul-de-sac of Douglas. She became afebrile at the end of July. In September she was readmitted to the clinic. Laparotomy was performed and actinomycosis of the right ovary was found. Bilateral removal of the adnexa was done. She was discharged from the clinic as well at the end of October.

In November she experienced mild intestinal symptoms. Six weeks after the operation she was given x-ray irradiation over seven fields in seven days, each irradiation being 400 r with 4 ma., F.K., 30 cm., and a filter of 1.5 Cu and 10 Al. She was also given Trauner's lymph-gland extract II. The symptoms disappeared. The general condition was good. The patient desired to marry.

Ovarian actinomycosis is always secondary to actinomycosis of the intestines. The condition may, however, recur after a considerable period of latency.

(CRISTOFOLETTI) JACOB E. KLEIN, M.D.

those of Hartmann and Jeanneney in France, and the work edited and distributed to physicians by the American Medical Association in the United States should be placed at the disposal of physicians. Ducuing has organized a course of lectures on cancer for physicians at Toulouse. The most competent specialists in the country lecture there. Midwives also should be taught the essentials of detecting lesions of the cervix. On detecting anything abnormal they should send the patient to a physician. The work of detecting cancer may be done in gynecological hospitals or in special cancer institutes. The social insurance societies should aid in the detection of cancer by giving examinations free or for a nominal charge and by instituting an anti-cancer propaganda.

The public must be made to realize that cancer of the cervix is curable in the majority of cases if diagnosed early and that the danger increases with the length of time before detection. They must be taught that the only means of treatment are surgery or roentgen or radium therapy. The language should be adapted to the understanding of the public to which it is addressed. It should be very simple for the uneducated classes and more scientific for those who are more educated. Every method of instruction should be used: lectures, leaflets, radio and newspaper publicity. There are good popular works on cancer control in the United States, Germany and England but very little material of this kind is available in France.

Dangerous advertising must be carefully supervised. In Hungary there is a medical commission which supervises all medical advertising in the press. Similar measures have been taken in Germany and Switzerland and should be taken in France.

AUDREY GOSS MORGAN M D

Curtillet E. The Metastases of Carcinoma of the Cervix (Les métastases du cancer du col). *Rev franç de gynéc et d obst* 1937 31 197

The author defines metastasis as any secondary cancerous nodule which is not in direct continuity with the primary lesion. He distinguishes three types: (1) distant adenopathies, (2) vaginovulvoperineal metastases and (3) metastases in other parts of the body.

While metastases in carcinoma of the cervix are rare when compared to those in mammary cancer, they are sufficiently frequent to warrant attention even though they rarely enter the clinical picture in an early stage. The question whether present day radiation therapy has caused metastases to appear earlier than formerly has been raised frequently but never answered. The author is of the opinion that radium therapy has not increased the frequency of metastases but admits the possibility that radiation treatment may cause them to appear earlier than they would otherwise. There is as yet no distinct agreement as to the relationship between the histology of the cancer and the metastatic tendency. When carcinoma becomes generalized an

average of from two to four metastases are found. Multiple metastases are frequent. All portions of the body may be involved. Clinical and post-mortem statistical studies differ as to the points of predilection for their occurrence.

Considerable difference of opinion exists as to the mode of spread of metastases. Retrograde metastases from retrograde embolism or lymphatic or venous blockage accounts for certain vaginal and vulvar lesions. For distant metastases the blood stream and lymphatics may be held accountable. The author believes that the common vertebral metastases result from retrograde metastasis through the prevertebral lymphatics and that cutaneous lesions especially in the region of the umbilicus, and pancreatic and skull localization are explicable only through the lymph route. Hepatic metastases are to be explained only through the portal blood stream.

The clinical diagnosis of metastases is often difficult. X-rays are of value in detecting bony involvement. Exploratory laparotomy may be necessary in other cases. Palpable adenopathies usually present no difficulties in diagnosis. Sacral and sciatic pain is the outstanding symptom of lumbosacral involvement. The clinical course is very variable. Approximately 50 per cent of the metastases appear within six months after treatment; the remainder appear in from seven to forty-eight months. At rare intervals the metastatic lesion is the first sign of cancer. The appearance of cancer generally means a poor prognosis for life expectancy usually from two to eight months. Retrograde metastases have a less grave prognosis.

Treatment must be individualized. Many metastases are inaccessible to either the surgical or radiation approach. Only the retrograde metastases promise any ray of hope. When the lesions are accessible radiation or surgical treatment occasionally gives at least temporary relief.

HAROLD C MACK M D

Michon L. Surgical Treatment of Cancer of the Uterus Not Associated with Pregnancy (Traité ment chirurgical du cancer du col de l'utérus—en dehors de la gestation). *Rev franç de gynéc et d obst* 1937 31 206

The author describes the technique of the palliative operations for cancer: simple amputation of the cervix and simple hysterectomy; also the radical operations: radical abdominal hysterectomy, vaginal hysterectomy, radical colpohysterectomy by the combined vaginal abdominal route and systematic removal of the glands. The indications for the use of these methods have been decreased greatly since the introduction of roentgen and radium treatment. The palliative operations are hardly indicated any more. Surgery may be associated with radiotherapy used either before or after operation.

The operative mortality before the introduction of radium therapy was more than 20 per cent in some statistics for the radical Wertheim operation. Since

The average duration of labor in primiparas was twenty hours and thirty-five minutes, in multiparas sixteen hours and twenty minutes. The more the pelvis was flattened, the longer the duration of labor, this was due in part to more frequent premature rupture of the membranes and abnormal presentations in flattened pelvis. Rupture of the perineum occurred in 273 of the spontaneous deliveries; 225 of the women were primiparas. There was some puerperal morbidity, *i.e.*, fever of 38°C or above, at some time after delivery in 183 cases, or 10.1 per cent of the 1,812 spontaneous deliveries. It occurred more frequently in primiparas than in multiparas. There were no maternal deaths in the spontaneous deliveries; 59, or 3.3 per cent, of the infants were still-born, and 7 of these were macerated.

All patients with contracted pelvis were kept under constant supervision while in labor, no general rules were established for operative interference, but a decision was made in each case, taking into consideration all factors, including the Henkal-Bokmen sign and the fixation of the fetal head according to Muller.

Operative delivery was necessary in 168 cases, in 28 of these because of transverse presentation. The simple forceps was used most frequently in 83 cases, version was employed in 41 cases, and the high forceps in 20 cases. Cesarean section was done in only 5 cases. Among these 168 cases there was puerperal morbidity in 41 or 24.1 per cent; one maternal death, and 58 or 34.5 per cent still-births, not counting the macerated fetuses and the fetuses in which the heart sounds had ceased before admission to the Clinic.

The author is of the opinion that in most cases of contracted pelvis, delivery by the vaginal route is preferable to cesarean section, and that the latter is indicated only when the disproportion between the fetal head and the size of the pelvis is absolute.

Alice M. Meyers

Anderson, D. F.: Intrapartum Infection. *J. Obst. & Gynec. Brit. Emp.*, 1937, 44: 264.

In a series of 11,075 deliveries at the Johns Hopkins Hospital 207 instances of intrapartum infection occurred, an incidence of 1.9 per cent, 33.3 per cent of the cases of intrapartum infection occurred in white patients and 66.7 per cent in colored. There was no appreciable difference in the mean age of the patients with intrapartum infection as compared with that of the clinic patients as a whole, 51.7 per cent of the patients were primiparas, while 24.6 per cent had had five or more children. Whereas in the clinic 3.4 per cent of the normal patients had vaginal examinations, 56 per cent of the patients having intrapartum infection were similarly examined, 56.3 per cent of the maternal deaths in the series occurred in patients who had been examined vaginally prior to admission to the hospital by their own medical attendants. The character of the labor pains was judged to be satisfactory in 50.2 per cent of the cases. The onset of labor was spon-

aneous in 77.8 per cent, and induction other than by drugs was performed in 22.2 per cent. The operative incidence for the hospital population of the obstetrical department was 22.9 per cent, while for the patients with intrapartum infection it was more than twice as great, *i.e.*, 48.8 per cent. Both the maternal mortality and the fetal mortality were more than twice as great in the patients subjected to operative procedures. In the patients with intrapartum infection the incidence of manual removal of the placenta was 4.3 per cent as compared with 0.8 per cent in the service as a whole. The mean blood loss was greater and the incidence of postpartum hemorrhage was more than double that noted in normal patients. Whereas 17.5 per cent of the total number of patients in the service developed puerperal infection, this complication occurred in 57 per cent of the patients with intrapartum infection. With an intrapartum elevation of the temperature to 100.8°F or less there was no maternal death, nor was a fatal result recorded in cases in which the pulse-rate did not exceed 100 per minute during labor. Prolonged labor, over 30 hours, occurred in 19.5 per cent of the primiparas and in 11.5 per cent of the series. The average duration of labor was considerably greater in patients with intrapartum infection than in the service generally. No maternal deaths occurred when labor was of less than five hours' duration. In the group of 176 patients with intrapartum infection, an elevation of the temperature was first observed before rupture of the membranes in 36.4 per cent, and after rupture in 63.6 per cent. Only one maternal death (6.3 per cent) occurred when the membranes had been ruptured for less than twelve hours prior to delivery. The total number of infants stillborn or dead before the sixth day after delivery was 70 (33.4 per cent). The stillbirths numbered 59 (28.2 per cent), with maceration of the fetus in 16 (21.1 per cent) of them. The maternal deaths in the series numbered 16 (7.7 per cent). Seven (43.8 per cent) of these occurred within twenty-four hours after delivery and 10 (62.7 per cent) within ninety-six hours. Conservatism is advocated in dealing with cases of intrapartum infection.

J. Thornwell Witherspoon, M.D.

Aldridge, A. H.: Extraperitoneal (Latzko) Cesarean Section. *Am. J. Obst. & Gynec.*, 1937, 33: 788.

Success with the extraperitoneal Latzko cesarean section demands. (1) obstetrical skill and experience in selecting cases with proper indications for the procedure. (2) a thorough knowledge of the anatomical relationships about the bladder and lower uterine segment. (3) training and experience in surgery as well as in obstetrics, in order to apply the procedure successfully and to avoid unnecessary surgical complications.

From a limited experience with the Latzko operation the author is convinced that when proper indications arise it is an invaluable procedure for the suprapubic delivery of infected or potentially infected cases. The method of approach for extraperi-

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Sussman W. The Use of Parathyroid Extract in the Control of Early Nausea and Vomiting of Pregnancy. *Am J Obst & Gynec* 1937 33 761

The patients in this study were divided into two groups. All of them were placed on a diet high in carbohydrates low in fat and with restricted condiments. The patients in Group I were given about 40 gr. of calcium daily by mouth usually in the form of phosphate and 10 ccm. of a 10 per cent solution of calcium gluconate at varying intervals intravenously. The patients in Group II were given the calcium orally and 100 units of parathyroid extract every two or three days, in some cases intramuscularly and in others intravenously. A few of the patients in the second group were also given calcium gluconate parenterally.

In Group I the nausea and vomiting persisted an average of 30.5 days after treatment was instituted and an average of 101 days in pregnancy. In Group II in which parathyroid extract was used along with calcium, the symptoms persisted an average of only 17.2 days and an average of 76 days in pregnancy. In Group II there were three patients in whom the parathyroid extract and calcium failed to control the vomiting. EDWARD L. CORNELL M.D.

Contiades Y. J. Research on the Morphology of the Postgravid Ureter. 2. Sequelae of the Pyelonephritis of Pregnancy (Recherches sur la morphologie de l'urètre postgravidique. 2. Séquelles des pyélonéphrites gravidiques). *J d urol mtd et chir* 1936 47 571

Many of the lesions of the urinary tract such as persistent pyuria, ureteral or renal stones, and renal sclerosis owe their origin to pyelonephritis starting during pregnancy which was not treated carefully enough afterward to insure its complete cure. Pregnancy predisposes to infection of the urinary passages because of the stasis produced. Where there is pyelonephritis during pregnancy roentgenographic studies reveal marked dilatation of the ureter and kidney pelvis.

The author has followed up fifteen cases of pyelonephritis which developed during pregnancy and has classified them as follows:

1. Cases with morphological modifications of the pelvis and ureter in the first six months after delivery. Examinations were made in the first six weeks from three to four months after delivery and from four to six months post partum.

2. Cases with morphological modifications of the pelvis and ureter after long standing pyelonephritis of pregnancy.

In conclusion the author states that ascending ureteropyelography offers a method of observing the changes that occur after delivery in pyelonephritis of

pregnancy and gives valuable aid in making a prognosis, as well as acts as a guide to proper treatment.

The observations show that a return to normal is quite rapid after relatively benign infections but dilatation remains for a long time after severe ones. This fact helps to explain the recurrence of pyelonephritic symptoms several years after a pregnancy in certain patients. MARSH W. POOLE M.D.

LABOR AND ITS COMPLICATIONS

Livchina R. L. The Management of Labor in Contracted Pelvis (Thérapeutique de l'accouchement dans les cas de bassin rétréci). *Gynec et obst* 1937 35 274

In considering the management of labor in the contracted pelvis Livchina notes that other factors than the absolute size of the pelvis are to be considered such as the size and malleability of the fetal head, the resistance of the soft parts and the strength of the uterine contractions.

At the author's clinic in Charkov any pelvis with an external conjugate less than 78 cm. was considered to be contracted, the true conjugate was measured only occasionally. During the five year period covered by this report there were only 3 cases of asymmetrical pelvis. During this period there were 13,200 deliveries at the Clinic, the pelvis was contracted in 1,930 cases, or 15 per cent. The flat pelvis was the most common type occurring in 880 cases, the just minor was next in frequency occurring in 685 cases, the flat just minor pelvis was found in 413 cases, and a contracted oblique pelvis in 2 cases, as noted.

In the 1,980 cases of contracted pelvis delivery was spontaneous in 1,812 or 91.5 per cent. This percentage of spontaneous deliveries is higher than reported in most clinics and is attributed by the author to his policy of expectant treatment in all cases of contracted pelvis. The highest percentage of spontaneous deliveries was obtained in the slighter degrees of contraction, i.e. in those cases in which the external conjugate was from 17.5 to 18 cm. In regard to the form of the pelvis the highest percentage of spontaneous deliveries was obtained in the flat just minor pelvis, this is natural as in this type of pelvis the fetal head is submitted to equal pressure from all sides and is therefore adapted more easily to the shape of the pelvis also. Women with this type of pelvis frequently have small infants. It is noted that spontaneous delivery occurred more frequently in primiparas than in multiparas which is explained by the greater force of uterine contractions in primiparas and also by the fact that the infant was usually smaller. In both primiparas and multiparas young women had a higher percentage of spontaneous deliveries than older women.

Fredrikson, H.: Three Cases of Chorionepithelioma. *Acta obst et gynec Scand*, 1937, 17, 82.

The discovery of the biological pregnancy reaction and the exposition of its significance in diagnosis, operative indication, and prognosis in hydatid mole and chorionepithelioma have given rise to a rich literature which has increased our knowledge of the often incalculable course taken by these tumors. Notwithstanding the fact that the Aschheim-Zondek reaction has become an extremely valuable adjunct, the estimation of certain cases of hydatid mole and chorionepithelioma may present great difficulties.

A summing up of the author's first case shows that spontaneous delivery of a hydatid mole took place in the sixth month of gestation. Five and a half months later a curettage made on account of bleeding from the uterus revealed nothing of a malignant nature. Two days following this curettage the patient coughed up blood. A roentgen examination revealed changes in the right lung giving the suspicion of tumor. During the following two months the patient had hemorrhagic discharges from the uterus, which was somewhat enlarged and softer than usual. The lung distinctly increased in size, presenting the typical picture of tumor metastases. At this time the Aschheim-Zondek reaction was positive. Three months following the curettage, a progressive improvement was noticed. The patient was free from symptoms and had normal menstruations. The pulmonary changes had disappeared without leaving any trace, and the Aschheim-Zondek reaction was negative. Sixteen months following the delivery of the mole the patient was still free from symptoms and the Aschheim-Zondek reaction was negative. In all probability thrombi containing chorionic epithelium were present in the veins of the uterine wall, these thrombi came loose at the curettage and were transported to the lungs.

In the author's second case there was spontaneous delivery of a hydatid mole plus curettage of the uterus. Clinical freedom from symptoms lasted for fourteen months. The Aschheim-Zondek reaction was positive and faintly positive with a sinking hormone concentration. As the Aschheim-Zondek reac-

tion was still positive a curettage was performed five months after the delivery of the mole without any tumors being demonstrable. Nine and ten months after the delivery of the mole there were less than from 1,600 to 800 mouse units of hormone per liter. After fourteen months of amenorrhea with enlargement of the uterus and a moderate increase of the hormone concentration, there were at most 33,000 mouse units per liter. On the presumption that a fresh pregnancy was in progress, further developments were awaited when, suddenly, a perforation of the chorionepithelioma occurred through the wall of the uterus with free hemorrhage in the abdominal cavity. Operation was performed, but death occurred. The patient also presented metastases in the lungs.

In the third case there had been a normal delivery in 1931. In April, 1933, there was an abortion, and in November, 1933, there was another infected abortion. In December, 1933, chorionepithelioma was found. There was a positive Aschheim-Zondek reaction at this time. After two blood transfusions a total extirpation of the uterus and adnexa was performed, which was followed by clinical freedom from symptoms, and the Aschheim-Zondek reaction was negative.

In a discussion of the cases, the author quotes about 25 authors who have written on the subject.

The author arrives at the following conclusions:

1. Pulmonary metastases may develop after curettage in the presence of a mole. (He brings up the question whether the metastases are caused by the curettage.)
2. Pulmonary metastases of chorionic epithelium are capable of healing spontaneously.
3. A chorionepithelioma may be present in the uterus in latent form over a long period even in a case presenting a very small quantity of prolan and no clinical symptoms.
4. Even though the quantity of prolan is small and manifests a tendency to decrease, close observation is necessary.
5. If a latent tumor begins to grow the quantity of prolan does not necessarily become large.

ALBERT MATHIEU, M.D.

tonal cesarean section as offered by the Latzko technique is anatomically the most logical one yet developed. The technique of the procedure is safe and not too difficult for those well trained in gynecology as well as obstetrics and bladder injuries can be prevented by a knowledge of the endopelvic fascia and dissection in the proper planes of cleavage.

In order to get adequate exposure of the lower uterine segment and to prevent accidental injury to the peritoneum and contamination of the peritoneal cavity it may be wise, in certain cases to incise the uterovesical fold of peritoneum deliberately by the method described before the uterine cavity is opened. Dependent drainage of the space of Retzius will promote healing of the uterine and abdominal incisions and increase the safety of the procedure.

The maternal mortality from cesarean section could be reduced if obstetricians would familiarize themselves with the technique of the extraperitoneal operation and refuse to adopt the abdominal route in cases where pre-operative conditions known to favor uterine infection have existed.

EDWARD L. CORNELL, M.D.

Couvelaire A. Results of Conservative Cesarean Operations by the Abdominal Route as Performed at the Baudelocque Clinic from 1920 to 1935 (*Résultats des opérations césariennes conservatrices par voie abdominale pratiquées à la Clinique Baudelocque de 1920 à 1935*). *Ann. Méd. Chir.* 127: 1937: 281.

During the fifteen years covered by this report there were 47,247 births with 686 cesarean sections done by the following three methods: (1) the routine manner (221), (2) low transperitoneal section (436), and (3) cesarean section followed by temporary exteriorization of the uterus (29).

There was a mortality rate of 4.5 per cent among the patients operated upon by the old cesarean method. These women were apparently free from infection after having been in labor less than twelve hours or after rupture of the membranes.

Infection was probably the principal cause of death because the amniotic fluid was shown to be contaminated by bacteria in 60 per cent of the cases three hours after the membranes ruptured although the subject had not been examined.

Low transperitoneal cesarean section offers two great advantages: viz. (1) the uterine scar is more favorably situated so that future gestations are less likely to cause rupture of the uterus, and (2) the more effective peritoneal covering of the operative wound helps in preventing peritonitis.

The mortality with this method was 2.7 per cent when the pre-operative clinical picture was very favorable as regards infection and when not more than twelve hours had elapsed from the beginning of labor or rupture of the membranes. 6 per cent when the condition of the patients was less favorable and 24.5 per cent when elevation of the temperature or some complicating pathological state was present.

From section through the fundus uteri followed by temporary exteriorization of the uterus the operation of Portes there was a mortality rate of 20.6 per cent. Of the 6 deaths 5 were the result of septicemia.

In conclusion Couvelaire recommends that operation should be performed at the beginning of labor after the patient has been prepared for intervention. The best results are obtained by the use of the low cesarean operation both for the pregnancy in question and for future pregnancies.

MARSH W. POOLE, M.D.

PUERPERIUM AND ITS COMPLICATIONS

Wadstein T. Puerperal Uterus Inversion. *Acta obst. et gynec. Scand.* 1937: 1, 22.

Inversion of the uterus is an extremely uncommon delivery complication.

A distinction is made between spontaneous and violent inversions. In all of the former and a good many of the latter a constitutional predisposition may be assumed to be the most important cause. A condition which leads to inversion is atony of the uterus. It need not be total. Partial atony some times occurs within the placental attachment. In cases of inversion atony is very often found in the fundus and is believed to bring on the inversion.

The most important causes of death are hemorrhage and shock either alone or together. It is most common to find them together. Shock alone can cause death as shown by the author's third case.

The treatment is reposition under anesthesia as soon as possible. The anesthesia prevents threatening shock or overcomes shock that is already present. The author gives an account of four cases of puerperal inversion of the uterus.

MISCELLANEOUS

Rubecchi E. Modifications of the Topographic Anatomy of the Fetus Resulting from Shoulder Presentations (*Modificazioni anatomico-topografiche fetali nella presentazione di spalla*). *Ginecologia* Torino 1937: 5: 221.

Röntgenographs taken after birth of both living and dead fetuses presenting by the shoulder enabled the author to show certain constant modifications of their topographic anatomy. These modifications consisted of lateral flexion of the spinal column at the cervicothoracic junction and compression and distortion of one side of the chest wall with elongation and expansion of the opposite side.

Definite changes were also reflected upon the topographic anatomy of the thoraco-abdominal viscera and vascular system as shown both by the injection of radio-opaque solutions into the umbilical vein and post-mortem examination.

The author believes that marked changes in the vascular system due to compression may account for a number of fetal deaths in shoulder presentations.

GEORGE C. FINOLA, M.D.

lateral traumatic nephritis have been advanced which may be summarized as follows.

The first, suggested by Guyon, is called the renorenal theory and is based upon the assumption that pressure, distension, and ureteral obstruction due to calculi and hydronephrosis may produce an inhibitory effect upon the function of the contralateral kidney.

The second theory, advanced by Castaigne and Rathery, is based upon the possible presence of nephrotoxins. The healthy kidney is believed to absorb the disintegration products of the affected kidney.

The third theory explains the condition as being the result of anatomical alterations involving the renal plexus. The affected kidney irritates its own nerves and gives rise to functional disturbances which in due time modify anatomically the structure of the renal parenchyma of the contralateral kidney.

The fourth theory states that a unilateral nephritis is transmitted to the contralateral kidney in the same manner as sympathetic ophthalmia is transmitted. This condition has therefore been called sympathetic nephritis. This theory, however, has not found universal acceptance.

After having reviewed the literature on this subject, the author presents a series of animal experiments in which he studied the changes in the contralateral kidney following subcutaneous contusion of the opposite kidney. He used a series of rabbits, and after having displaced one kidney by fixing it to the skin and placing it above the lumbar muscles without injuring the ureter and the blood vessels, he traumatized the organ by means of a polyp forceps.

Following the intervention all of the animals developed hematuria which usually persisted for five days and varied in intensity with the severity of the trauma. During the first few hours there was also a decreased diuresis associated with a decreased urea elimination and a possible increase of the urea level in the blood.

Histological examination of the contralateral kidney following contusion of the displaced kidney did not reveal any nephritic changes in any case. Microscopic examination of the urinary sediment did not reveal the presence of any casts, and a true albuminuria did not occur.

It is important to note however, that if the traumatized kidney is infected, the contralateral kidney undergoes degenerative changes in the epithelium and convoluted tubules.

The author concludes that in non-infected renal contusions no changes will be observed in the contralateral kidney, but if a focus of infection is present in the traumatized kidney, the contralateral kidney may become involved. The lesions found in a contralateral kidney resulting from the contusion of an infected kidney bear no relationship to those found in Bright's disease.

RICHARD E. SOMMA, M.D.

Carli, G.: Renal Tuberculosis Caused by the Avian Type of Tuberculosis Bacillus (La tubercolosi renale da bacillo della tubercolosi aviaria) *Arch ital di urol*, 1937, 14:3

Carli states that up to a few years ago it was believed that avian tuberculosis is found exclusively among birds and that man is immune to this type of acid-fast infection. Subsequent studies, however, have shown that not only various other animals but also man may become infected with avian tuberculosis.

The first description of avian tuberculosis occurring in the human being was given by Lowenstein in 1913 who observed a three-year-old girl and a thirteen-year-old boy with daily elevations of temperature in the evening. On examination of the urinary sediment occasional leucocytes and a large number of acid-fast organisms were found. Subsequent laboratory examinations with specific tuberculin revealed the presence of an avian type of acid-fast infection. Both children recovered uneventfully following the institution of specific therapy with avian tuberculin.

Various other reports have been made in the literature and their number is large enough to allow the conclusion that man is not at all immune to avian tuberculosis as was formerly believed. These studies have also shown that the clinical and anatomicopathological features of this disease are typical and quite different from those observed in the human type of tuberculosis.

The disease begins usually with elevation of the temperature, which may last over a longer period of time without the patient being aware of it. Following this first stage, which may be absent or may be interrupted by periods of remission, there follows the stage of localization. The organs most commonly involved are the kidneys, the bones, and the skin.

In the kidneys, the lesions consist essentially of inflammatory infiltrates of the pseudonodular type. There are no typical tuberculous nodes, and the lesions never caseate nor ulcerate.

It is also interesting to note that concomitant tuberculous lesions of the urinary bladder have never been found, even in advanced cases of renal tuberculosis of the avian type. The urinary sediment shows almost always occasional white cells and a large number of acid-fast organisms which are often intracellular and are eliminated in showers.

It is also to be noted that in almost all of the reported cases, especially those with kidney involvement, the patients recovered either spontaneously or with the aid of specific tuberculin therapy.

The author reviews briefly the literature concerning the experimental work done with animals. This work was done for the purpose of determining the susceptibility of various animals and their mode of reacting against the infection. Unfortunately only a few reports have appeared concerning the evolution of the disease, especially with reference to the urinary tract.

RICHARD E. SOMMA, M.D.

GENITO-URINARY SURGERY

ADRENAL KIDNEY AND URETER

Simpson C K Pathology of the Adrenal Gland in Relation to Sudden Death *Lancet* 1937 232 851

The author discusses the developmental anatomy and physiology of the adrenal glands. He states that after surgical removal of one adrenal hyperplasia of the cortex of the other gland occurs but it is an inactive process requiring three months or more under the most encouraging conditions when no disease is present. Regeneration is far too slow and uncertain to play any part in staving off insufficiency. Accessory renal tissue develops rarely occurring once in 1000 autopsies.

The author then discusses the pathological anatomy of the adrenals and points out that these glands are the site of hemorrhage which may be extensive at two periods during life. First is the neonatal hemorrhage which occurs a few hours or days following birth. This process is primarily physiological and not due to birth trauma alone. The author points out that it may occur after the most carefully done cesarean sections. Thrombosis of the adrenal vein is frequently found in these cases. The second type of hemorrhage is a purpuric type which is also frequently associated with thrombosis of the adrenal veins. It occurs at later periods of life following development of a purpuric tendency of whatever cause particularly septicemia. The same pathological process is seen with some frequency in severe burns. Adrenal deficiency also occurs with the development of cystic hematomas. It occurs with acute caseous tuberculosis however the course is more insidious accompanied by fibrosis and calcification. Tuberculosis accounts for about 70 per cent of the cases of Addison's disease. The adrenals may be invaded by malignant growths, and although one gland may be completely destroyed the other gland is rarely if ever affected. Consequently acute insufficiency is not seen with primary malignant growths. Metastases are more likely to result in destruction of both glands and may produce acute adrenal insufficiency.

The author discusses the pathological physiology giving the chronological symptoms which result in adrenalectomized dogs surviving less than fifty hours. The blood chemistry studies reveal a rise of cholesterol and a fall of blood sugar. The latter may reach convulsive levels. There is diminution of liver and muscle glycogen with failure of restoration after exercise. There is diminution of kidney function as well as diminution of blood volume and blood chloride. Immediate relief of these situations may be obtained by restoring the electrolyte balance. The control of sodium may be attributed to the adrenal cortex. The three biochemical changes which have a part in the cause of death are loss of sodium hypoglycemia and dehydration.

GILBERT C THOMAS M D

Smagghe H Bilateral Hydronephrosis (Les hydronephroses bilatérales) *J d'urologie méd et chir* 1937 43 5

Diverse opinions are expressed by various authors as to the proper treatment of hydronephrosis and the treatment recommended ranges from the strictly conservative to radical surgery. Various theories as to the causation also have their ardent advocates. Among the causes noted are renal mobility, abnormal vessels congenital abnormality and the more recent physiopathological concept presented at the Congress of Madrid.

Smagghe presents in detail twelve case histories and includes an extensive bibliography.

Bilateral hydronephrosis has been found to be more common than was formerly supposed because of better methods of investigation. Intra venous pyelography usually revealed the bilateral nature of the condition even though ureteral catheterization was impossible.

The author discusses in detail the mechanical causes for the dilatation of the ureters or the kidney pelvis such as congenital bands or links calculi abnormal vessels hypertrophy of the prostate pelvic inflammation uterine prolapse uterine tumors and pregnancy.

The clinical symptoms were variable. There was only a vague feeling of discomfort in the lumbar region or there were crises resembling those of renal colic. When both sides were affected pain could be felt only on the side showing the greatest enlargement.

Lithiasis and infection occurred readily because of stasis of the urine and alteration in its pH values. Anuria occurred at times but it was present more frequently when there was hydronephrosis of only one side.

The prognosis in bilateral hydronephrosis was very grave as the renal insufficiency gradually became greater until uremia occurred.

The treatment altered the prognosis only if the operation could be performed early in the types due to obstruction. Radical treatment of hydronephrosis on one side was never undertaken until the other side was proved to be normal. In all cases of hydronephrosis a systematic examination was made of both sides. Temporary drainage of the kidney was a useful procedure in large infected hydronephrosis when conservative treatment was necessary because of involvement of the opposite side.

MAASH W POOLE M D

Ciddio D Traumatic Nephritis (La nefrite traumatica) *Ididina* Rome 1937 44 324

Ciddio states that much discussion has been made of the question whether a subcutaneous traumatic injury of one kidney causes alterations in the other. Four theories concerning the pathogenesis of bi-

The only conclusion to be drawn from this survey is that adult renal sarcoma is just as fatal as embryonal carcinoma in children. Of 65 patients, 21 are living, and only 3 have passed the five-year period. Regardless of the type of sarcoma, death usually intervenes.

LOUIS NEUWELT, M D

BLADDER, URETHRA, AND PENIS

Maggi, N.: The Results of Simultaneous Transplants of Bladder Mucosa and Aponeurosis into the Spleen (Sugli esiti dei trapianti contemporanei di mucosa vescicale e di aponeurosi nella milza) *Arch ital di chir*, 1937, 45 37

Maggi discusses the humoral theory of osteogenesis and, more particularly, bone formation associated with grafts of bladder mucosa and aponeurosis. He repeated Sureya Cemil's experiments, transplanting simultaneously autoplasmic fragments of bladder epithelium and aponeurosis from the thigh into the spleens of rabbits, which have a very active calcium metabolism, and observing the results at various periods between fifteen and one hundred and twenty days. The results of the ten experiments were as follows:

During the first few days there was rapid proliferation of connective tissue which split up the epithelium into islands. Apparently there was no epithelial proliferation. Absorption in the centers of these nodules gave rise, after from twenty to thirty days, to cystic cavities lined with several layers of epithelium and surrounded by young connective tissue in contact with the aponeurosis. As the cysts enlarged, their walls became thinner, and the lining was finally reduced to a single layer of flattened epithelium. The aponeurosis gradually underwent regression. In only one case was there a certain suggestion of the formation of young membranous bone in the subepithelial connective-tissue fibers. These fibers seemed to surround themselves with a substance, at first amorphous, and later fibrillar, in which beginning calcification was demonstrated. The nuclei remained embedded in this matrix. The essential findings are a pre-osseous substance, probably derived from differentiated connective-tissue cells, and the formation of a new tissue completely different from both of the grafts and somewhat similar to young bone tissue.

Evidently the specific power of inclusions of bladder mucosa to originate bone in young connective tissue is influenced by the site of the graft or the species of the experimental animal. The hypothesis that this power is due to the liberation of some substance which precipitates calcium salts in collagenous fibers is not entirely acceptable.

The conclusions from these experiments are that the simultaneous implantation of fragments of bladder mucosa and aponeurosis in the rabbit spleen usually produces cystic formations. In exceptional cases the connective-tissue cells undergo an initial process of metaplasia which gives rise to a tissue somewhat similar to young bone, and this tissue is

probably formed at first in the absence of any deposit of calcareous salts.

The article is accompanied by photomicrographs and a bibliography.

M E MORSE, M D

GENITAL ORGANS

Biasini, A.: Anatomical and Pathological Studies on the Behavior of the Bladder, Prostatic Cavity, and Upper Spermatic Tract Following Transvesical Prostatectomy (Ricerche anatomicopatologiche sul comportamento della vescica, della loggia prostatica e delle vie spermatiche alte dopo prostatectomia transvesicale) *Arch ital di chir*, 1937, 45 311

Histological studies on the conditions after prostatectomy are not numerous and their results are somewhat discordant. Biasini undertook an exhaustive study of the bladder, prostatic cavity, and upper spermatic tract in eight cases which came to autopsy at various periods up to two months following operation. The purpose of the research was to furnish a basis for the interpretation of postoperative disturbances, to discover norms, and to determine the planes of tissue separation which would furnish the best scars and avoid postoperative complications.

The bladder was always globular and retracted, and showed much hyperplasia of the muscular and elastic tissue, accompanied by inflammation which was most marked in the mucosa and absent in the serosa.

The prostatic cavity tended to disappear rapidly, although its reduction was not always proportional to the length of the postoperative period. The walls showed active proliferation of the connective tissue, atrophic glandular remnants, a new growth of elastic fibers, and inflammation which was more marked than that in any other situation. In only one case, thirty-eight days after operation, epithelial regeneration took place. Reparative changes in the scar after prostatectomy evolve slowly when compared with those following other operations on account of the patient's age, the inevitable inflammation, and the impossibility of protecting the young epithelium.

The ejaculatory ducts, seminal vesicles, and vasa deferentia showed slight inflammation in connection with the bladder and prostatic cavity.

The author emphasizes particularly the behavior of the elastic tissue. Both regression and proliferation were evident. In the bladder and spermatic tract the proliferation of the elastic tissue was slight in comparison with that of the connective tissue, while in the prostatic cavity it was marked. The inflammation may prevent or disturb the formation of new fibers, but when the sclerosis has become stabilized, proliferation may be accentuated. The frequent changes in volume of the bladder are a contributing mechanical factor. The greatest importance of the proliferation of elastic tissue is that it reinforces the action of the smooth muscle. The elastic fibers are more resistant to senile degenera-

Leruitte A. Central Abscess of the Kidney of Hematuric Form (L'abcès central du rein à forme hématurique) *Bruxelles méd* 1937 17 689

The author reports three cases of single central abscess of the kidney in which the predominant clinical sign was asymptomatic hematuria. In each case carcinoma of the kidney was suspected and the involved kidney was removed. There was no fever, no pain, no palpable kidney but colon bacilli were found in the urine and ureteral catheterization showed a diminution of the urea concentration and output of the affected kidney when comparison was made with the normal kidney. Grossly the central abscess presented an appearance suggestive of infected cyst or it was filled with partially necrotic tissue which resembled a degenerating tumor. Microscopic examination finally showed that in each case the condition was solely an infectious lesion with no evidence of tumor or cyst wall.

The author discusses at length the cause, pathological anatomy, clinical symptoms and differential diagnosis of this condition.

The cause is unknown but in the three cases colon bacilli were found in the urine. There was no history of antecedent infection. Pathologically an ordinary abscess more or less circumscribed by a pyogenic membrane was found. In the case which was most carefully studied, smalliliary abscesses were found just outside of the main abscess. The author believes that congestion secondary to inflammation was sufficient to account for the hematuria.

Clinically the following triad of symptoms were observed: (1) hematuria, (2) functional deficiency of the affected kidney, and (3) alterations in the outline of the renal pelvis. Cystoscopic, ureteral catheterization and retrograde pyelography are necessary to establish the diagnosis.

In the differential diagnosis the following must be considered: (1) renal tuberculosis, (2) pyelonephritis with hematuria, (3) infected renal calculus, and (4) infected tumor. After a careful analysis the author concludes that it is difficult to diagnose central hematuric abscess of the kidney. Pyelonephritis and calculus were readily eliminated but abscess, cancer and tuberculosis could not be differentiated as easily. It was only by using all of the modern methods of investigation that localized suppuration could be ascertained.

With regard to treatment, nephrectomy is recommended if exploration shows a kidney of normal size. If the diagnosis of solitary abscess can be established, macroscopically, incision and drainage only are recommended. If a neoplasm cannot be excluded, nephrectomy should be performed.

M. M. ZINSINGER, M.D.

Mintz E. R. Sarcoma of the Kidney in Adults. *Ann Surg* 1937 105 521

Sarcoma of the kidney in adults is rare. Ninety-three such tumors are reported. A complete survey of the literature was made and all questionable cases were omitted. No case was accepted unless the

microscopic report allowed no doubt of the nature of the tumor. Previous to 1910 renal cancers were sometimes classified as sarcomata. Only those cases of round cell sarcomata were acceptable in which it was definitely shown at autopsy that the renal lesion was not part of a generalized blood dyscrasia or an anaplastic carcinoma. Unless the history definitely stated that the sarcoma originated in the kidney substance it was omitted. This excluded retroperitoneal tumors such as sarcomas and lymphoblastomas, neurogangliomas, sarcomas of the renal capsule, neuroblastomas and other adrenal tumors. No author has drawn the line as to when a renal sarcoma may be called an adult renal sarcoma. All cases of renal sarcoma in patients under 21 years of age were excluded.

As to the age incidence, it was not stated in 21 cases, 55 per cent of the cases occurred between the ages of 40 and 60 years, 33 per cent of the patients were under 40 years, and 12 per cent were in the sixth and seventh decade. The sexes were equally divided. Both sides were affected the same number of times. Bilateral involvement occurred once.

The histopathology of these tumors varies and is of little help practically. The tumors all seem to be equally fatal. Twenty different names have been applied to them. In this series there were 23 spindle cell sarcomas, 12 fibrosarcoma, 16 sarcoma, 6 leiomyosarcomas, 4 mixed cell tumors, 2 Wilms tumors, 11 embryonal mixed tumors, 2 embryonal myosarcomas and one each of embryonal adenocarcinoma, embryonal adenocarcinoma, lipoleiomyosarcoma, lipomyosarcoma, liposarcoma, fibromyxosarcoma, myosarcoma, rhabdomyosarcoma, reticular cell sarcoma, round cell sarcoma, teratoma and osteoblastoma. The bilateral tumors were separate tumors and not extensions. Two different types of tumor in the same kidney were noted 5 times. Stones occurred 3 times. Scant data were obtained relative to metastases which differed little from adenocarcinoma or hypernephroma in the organs attacked. Invasion of the renal pedicle and diaphragm, the liver, lungs and peritoneum by metastases were frequently found at necropsy.

The symptoms resembled those of other types of adult cortical tumors. A tumor mass is not as common as in sarcoma in children. The triad of hematuria, tumor and pain are the chief complaints. Gastrointestinal symptoms are lightly more frequent than in other renal tumors. Varicocele was the chief complaint in one case. Anemia, loss of weight, lassitude and edema of the legs were noted many times.

Of 73 patients who had nephrectomies, 23 were not followed up, 30 died, 19 after operation usually from shock and hemorrhage. Some had multiple metastases and never should have had nephrectomy. Nine others died within the first year, and 2 died after 6 and 8 years respectively. Recurrences occurred 4 times. Twenty-one patients are living, 13 less than one year. Six have passed the first year, 3 the fifth.

tumor. Although the occurrence of an orchitis due to strain is disputed, cases of testicular bacillus coli infection from strain when the infected bladder was full have been reported. Injury to an infected hydrocele may spread the infection to the testis. Wesson believes that seminal vesiculitis, and not contusion or strain, is responsible for the epididymitis diagnosed as "traumatic orchitis." Simple contusions of the testicle produce hemorrhagic spots. There may be edema and the testicle may become enlarged and hard. Fibrosis may follow. With extensive cicatricial contracture atrophy of the testicle may result. In true trauma of the testis there are constitutional symptoms, such as nausea, vomiting, great weakness, fainting, and extreme shock, which occasionally result in death, or there is local evidence of extravasation of blood with pain, loss of function, swelling beneath the deep fascia, and prompt discoloration. In spite of the number of cases of testicular tumors with a history of trauma, it is doubtful whether trauma causes neoplastic processes.

If trauma and infection can be eliminated in cases of testicular swellings associated with tumors, a diagnosis of testicular tumor should be made. The present accepted view is that most tumors of the testicle are of embryonal origin. More than 95 per cent of them originate from aberrant sex cells, and as the testicle contains the three germinal layers, neoplasms may arise from any of them. Any type of tumor is possible—homogeneous and heterogeneous, benign, and malignant. It usually appears during active sex life.

Opinions still differ regarding the classification and types of testicular tumors. Chevassu's classification was generally accepted until recently. Ewing believes that all malignant tumors of the testicle are of embryonic origin and therefore teratomas. A chorionepithelioma is occasionally found in testicular tumors. Only a small percentage of these tumors are benign, among which Tanner includes dermoids, fibromas, lipomas, myomas, and chondromas. The incidence of tumor arising in cryptorchidism varies between 11 and 15 per cent. Testicular tumors have been found in 1 of 983 patients among 40,000 hospital entrants. Malignant growths comprise 3.39 per cent of all tumors of the genito-urinary system, and 2.09 per cent of all malignant tumors in the male. The right testis is affected more often than the left. Bilaterality is rare. According to Tanner, 96 per cent of the testicular neoplasms are malignant. They are rare in children.

There are no pathognomonic symptoms of malignant testicular tumor. There may be a mass in the scrotum or groin with or without dragging pain, shortness of breath, cough, or swelling of the legs. Usually there is no pain in the early stages, after pain is felt, metastases are usually rapid. Later there is loss of weight and appetite. At first the tumor is firm and smooth, later nodular. The epididymis is usually unchanged and the skin is freely movable. Clinically, the symptoms may be divided into three stages: the onset, when the testicle is still

in the scrotum; the evolutionary stage, when the gland is greatly enlarged, and the final period with grave symptoms and lymphatic involvement of the lumbosacral region and cord. The clinical diagnosis is made by exclusion. A testicular tumor may be masked by a greatly thickened tunica vaginalis, hydropididymitis or a tuberculous lesion of the testis. The presumptive physical signs are loss of testicular sensation, and a hard and solid consistency and heaviness of the tumor. The size of the tumor is usually that of a fowl's egg. The spermatic cord is thickened; and the layers of the tunica vaginalis can be compressed easily. If there are metastases, nodules are palpable in the cord and a mass along the lymphatics. Biological tests help to diagnose malignant tumors and to differentiate them from benign tumors, they also help to determine the presence of metastases before they appear clinically, and detect hidden metastases that resist irradiation treatment. Testicular malignant neoplasms metastasize very early and are often present but not determinable clinically. They spread via the lymphatics to the lumbar glands and the spermatic vessels and later to the retroperitoneal glands. They may travel quickly via the blood to the lungs, liver, and other viscera.

The urine of patients with embryonal tumors contains a notable amount of gonadotropic hormone. In normal men and patients with benign testicular tumors, the hormone is less than 50 mouse units, whereas in patients with teratoma of the testis it varies from 50 to 16,000 mouse units per liter of urine. This test is positive in 60 per cent of testicular tumors independent of the nature of the tumor. It should be noted, however, that the test is positive in the presence of an embryonal tumor elsewhere, and, also, that a specific testicular tumor may give a negative test, and a pure seminoma may not cause excretion of an increased follicle-stimulating factor in the urine. The hormone-excretion test is valuable in determining the presence or regression of metastases. If the hormone persists postoperatively, there are usually hidden metastases. A local recurrence of tumor or metastases is generally preceded by an increase in the excretion of the hormone. This is valuable in checking the necessity for more radical surgery of testicular malignancies. The test makes diagnosis possible before the malignancy has extended beyond the testis and before extensive metastases have rendered the case inoperable.

There are three methods of treating testicular tumors: (1) simple orchidectomy, (2) irradiation with or without castration, and (3) castration with removal of the primary and perhaps secondary lymph zones. In almost all of the cases the authors advise surgery followed by thorough irradiation both locally and generally. Extensive surgery is not only futile but practically unnecessary. The cord should be cut before handling the tumor to prevent the dissemination of malignant cells. Operative inoculations must also be avoided. The authors have discarded preliminary irradiation.

tion and operative injury than the muscular fibers. The resistance of the former is greatest where infection is least and the compensatory processes proceed normally.

In the critical discussion of his results, *Basian* emphasizes that his data are insufficient to reconstruct the finer mechanism of regeneration. The physical and pathological effects of prostatectomy are relatively uniform. Reparative changes begin early, increase in proportion to the lapse of time following operation and go on to complete epithelial regeneration if the inflammation is not too intense. The continued contact with contaminated urine plays a large part in the regressive phenomena. The new functional adaptation of the bladder is biologically sufficient.

Photographs and a bibliography are given.

M E Morse MD

White E W and Gaines R B. Testicular Swellings. *J Am U* 115 1937 108 1227

Testicular swellings occur with primary and secondary infections, traumatism, and tumors of all types. They must be differentiated from epididymitis, hydrocele, hematocele, and infections and tumors of the cord and testicular tunics. True testicular swellings associated with tumors usually occur in adults, although infants and the very aged are affected also. Certain infectious diseases of childhood may cause infectious orchitis, but this and traumatic orchitis may occur at any age.

A thorough medical, physical and urological examination including Bordet and Wassermann, Hecht blood tests and careful tuberculosis studies is of paramount importance. The spermatic cord on the affected side should be palpated at the external abdominal ring and its constituents palpated. If the constituents feel normal the swelling is not a hernia or abdominal lesion. Hydrocele of the tunica vaginalis or of the spermatic cord must also be differentiated. The first is pear shaped and blends with the testis; the latter is globular and lies above and distinct from the testis. Both are fluctuant and if recent are translucent on transillumination. A hydrocele may be independent or a complication of testicular swelling. If an existing hydrocele is suspected of masking testicular disease it may be tapped and emptied so that the testis itself may be investigated.

If hydrocele is eliminated, hematocele and epididymitis should be suspected. If the tunica vaginalis can be palpated on the surface of a scrotal tumor, hematocele may be eliminated. The epididymis also cannot be palpated between the fingers in hematocele. A hematocele may be recognized by the following findings: a history of local trauma, negative transillumination, lost testicular sensation, difficulty in distinguishing between the testicle and epididymis, a swelling which is usually round, solid and hard and about the size of a duck's egg. The tumor feels heavy, the spermatic cord is often thickened and the layers of the tunica

vaginalis cannot be felt between the fingers. Needle puncture so hematocele is useless and dangerous.

Epididymal enlargement is usually not malignant but inflammatory. The condition is usually tuberculous or pyogenic. Primary tuberculosis of the testis is very rare. Epididymal tuberculosis usually shows nodular areas alternating with caseating areas and nodulations of the vas. The pyogenic cases reveal a tender prostate and seminal vesicles or inflammation about the urethra or bladder neck. If none of these conditions is present it may be concluded that the swelling is due to a lesion of the body of the testis and that the possible lesions are infectious such as syphilis and tuberculosis, trauma or tumor.

Testicular inflammation without coincident prostatitis and seminal vesiculitis indicates a hematogenous infection but is fairly rare. Acute infectious orchitis is seen in mumps, typhoid, pneumonia and smallpox. Testicular infection may also occur via the lymphatics, vas, epididymis and other associated structures, also from injuries to the cord or operations by contiguity. Although suppuration is rare and most of these cases recede without aid, only of the testis, considerable sloughing may occur with ultimate destruction of the testis. Suppurative orchitis following instrumentation is common but is not reported.

Tuberculosis occurs in less than 10 per cent of testicular swellings (Dean). The family and personal histories are of value and roentgenograms may show active pulmonary tuberculosis. Rectal palpation discloses prostatic and seminal vesicular involvement. Before a tuberculous testis can be attributed to contusion, two conditions are necessary: the blood must be filled with tubercle bacilli from an infected locus and at the same time the testicle must be injured anatomically so that the site provides a suitable culture medium for the tubercle bacilli. Trauma as a cause of tuberculosis must be extremely rare. However, a tumor of the testis may extend from the rete testis into the epididymis and simulate tuberculosis or into the vas and suggest tuberculous thickening of the vas in subject giving a history of tuberculosis.

In testicular syphilis, testicular sensation is lost, the swelling is often hard and solid in early syphilis and of the size of a pullet's egg. It is ovoid, globular or pear shaped and of light weight. The spermatic cord is rarely thickened and the layers of the tunica vaginalis may be palpated. A positive Wassermann is not diagnostic but other things being equal a testicular swelling should respond to specific treatment within four to eight weeks. Malignancy and syphilis of the testicle may coexist and the testicle may be so distorted by tumor tissue as to resemble gumma of the testicle.

Chevassu states that in testicular swelling due to trauma the trauma must be manifest, consisting of scrotal swelling with blood extravasation and there must be a free interval of several months between the accident and the appearance of the testicular

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Caffey, J.: The Skeletal Changes in the Chronic Hemolytic Anemias (Erythroblastic Anemia, Sickle Cell Anemia and Chronic Hemolytic Icterus). *Am. J. Roentgenol.*, 1937, 37 293

Caffey states that the common pathological mechanism in erythroblastic anemia, sickle-cell anemia, and chronic hemolytic icterus is believed to be the generation of abnormal erythrocytes by the blood-forming organs. The hyperplastic and expanding bone marrow in these anemias might produce secondary changes in the skeletal system demonstrable in the roentgenograms. The literature on this subject is reviewed. Characteristic roentgen findings are described in twenty-one cases of erythroblastic anemia. The earliest lesion of the skull was found to be a thickening of the lower frontal squamosa. This gradually increased and extended backward. Radial striations developed first in the anterior portion of the parietal bones near the sagittal suture. The earliest lesion in the long bones was dilatation of the medullary canals with simultaneous atrophy of the cortical bone and the cancellous bone. Reticulation appeared several months after the first changes were apparent. The late skeletal changes in a long standing severe case of erythroblastic anemia were osteosclerotic, and were due to a late increase of the cancellous bone. Two mild cases with a late onset presented no diagnostic changes in the skeleton.

In fifteen cases of sickle-cell anemia no significant roentgen changes were found in the long bones. Ten cases showed thickening of the calvarium similar to that in erythroblastic anemia. Vertical striations of the skull were not present in any case. In contrast to erythroblastic anemia, the parietal bones showed more marked involvement than the frontal.

In six cases of chronic hemolytic icterus, no significant roentgen changes were noted in the long bones. Two cases showed thickening and striation of the calvarium similar to that of erythroblastic anemia. In both cases the parietal bones were more involved than the frontal. No roentgen or clinical signs of premature synostosis of the cranium were present in this group of six cases.

The author includes case histories and detailed roentgen examinations of the twenty-one cases of erythroblastic anemia, and twelve illustrations of typical roentgenograms. HOWARD L. ALT, M.D.

Buchman, J.: The Use of Staphylococcus Toxoid in the Treatment of Chronic Osteomyelitis. *J. Am. Med. Ass.*, 1937, 108 1151

In view of the promising reports made the author hoped to immunize patients against future exacerbations of old lesions, prevent new metastatic lesions in bone and soft tissues, and expedite the healing of

existing lesions with staphylococcus toxoid. With this idea in mind he began in 1934 to administer the toxoid in a group of unselected cases of chronic staphylococcal osteomyelitis. This group consisted of thirty-eight patients ranging in age from seven to fifty-five years. The infecting agent in all was proved to be the staphylococcus aureus.

During the course of the treatment the patients presenting true bone lesions were subjected to radical saucerization operation when the anatomical topography permitted. The great majority of the patients were subsequently treated with maggots. A few of them were treated with Lederle "maggot enzyme," and several were treated with allantoin supplied by the Bureau of Entomology of the U.S. Department of Agriculture. Chronic skin ulcers were treated with live steam, cod-liver-oil ointment as described by Loehr, or with injections of allergic serums according to the Walzer technique.

The author used throughout this investigation a commercial stock of Lederle polyvalent staphylococcus toxoid consisting of two dilutions: Dilution 1 contained 100 units per cubic centimeter, and Dilution 2 contained 1,000 units per cubic centimeter. The manufacturer described the "unit" of staphylococcus toxoid as "the toxoid obtained from a dermonecrotizing unit of toxin (the least amount of toxin which on intradermal injection in a susceptible rabbit will produce an erythema with a central necrosis at least 5 by 5 mm in diameter)". An average of 17.9 injections was given to each patient over forty-five days. The minimum number of doses was five, while the maximum was thirty. The minimum duration of the toxoid therapy in any case was twenty-two days, while the maximum was one hundred and thirty days. The average total number of units administered was 10,515. Three patients received less than 1,000 units, and the maximum total dosage in any case was 24,300 units.

An initial anti hemolysin titration was done in each case prior to the beginning of toxoid therapy, and from two to nine titrations were done during and after the course of treatment. The average number of titrations for each patient was five.

The author found a definite rise in the titer in all of the thirty-eight cases following the administration of staphylococcus toxoid. In every instance the number of injections necessary to raise the titer of the serums to their maximum was greater than has been reported by others. The maximum titer obtained in the serums of two patients was 28.8 international units. This represented an increase of 4.5 and 7 times the initial titers.

In eighteen of the author's thirty-eight cases new lesions developed during or soon after the course of toxoid injections. Two of the patients required resaucerization of their affected bones. In one of these this procedure had to be done when the

There is a great difference in the degree of sensitivity of the various types of testicular tumors to irradiation the spermatogonia are the most sensitive while the spermatocytes are less sensitive. Pure seminomas and homogeneous embryonal carcinoma are radiosensitive and if hormone tests disclose a tumor of such type without metastases irradiation without surgery may be tried. The authors hesitate to rely solely on irradiation for the treatment of a primary testicular tumor. The growth of the tumor may be temporarily restrained, but later dissemination of metastases may occur and there is danger to the opposite testicle from the intensive irradiation of the affected side. Of 45 patients with testicular neoplasms 30 presented no clinical evidence of metastases when first examined and 15 presented definite secondary involvement. Of the 30 patients 12 were treated by radical surgery and all showed glandular metastases but 8 survived from two to seven years. Eighteen were subjected to simple orchidectomy, 10 with irradiation and 8 without and lived for from two to five years. The 15 patients with clinical evidence of metastases were treated by orchidectomy and high voltage x ray irradiation and all succumbed in from six months to three years. Cases of teratoma without suspected metastases are the best suited for radical surgery.

The date of onset the hormone estimation the radiosensitivity and the type of tumor must be carefully studied in all cases of testicular swellings.

LOTIS NEONELT M D

MISCELLANEOUS

Hellstrom J. Staphylococcus Stones. A Clinical Study of Ninety Cases. *Acta chirurg Scand* 1936 79 Supp 40

The author presents a complete discussion of the subject of staphylococcus stones. These are stones consisting of calcium carbonate calcium phosphate and ammonium magnesium phosphate with an organic framework composed of staphylococci. Bacteria entering into the composition of the stone itself staphylococci have the capacity to split urea thereby initiating a disturbed colloid crystalloid equilibrium

which leads to precipitation of the salts from which the stones are formed. Obstruction and the formation of local lesions play a small part in their formation. The stones develop most commonly in chronic staphylococcal infection the source of infection in many cases being the male adnexa or the female genital organs. Pathological changes in the urinary tract are usually of mild degree. When they are more severe they are usually due to secondary infection.

The stones are usually small and hard but may attain considerable size and have a tendency to recur. In 30 per cent of the reported cases they were bilateral.

Most of the cases reported had a rather long history, usually several years of mild urinary tract infection before the initial renal colic. The fresh urine was usually acid in reaction and the staphylococci occurred in large numbers and in pure culture. In some the culture was sterile and the staphylococci were found only in the framework of the stone. The infection was commonly bilateral even though the stone was found only on one side.

In the x ray examination it was important to know that on account of loose composition or high organic content some stones gave thin contrast shadows and might be overlooked.

In the treatment there were two aims removal of the stones and elimination of the infection. Expectant treatment was indicated in stones of a size which might pass spontaneously. Seventy three patients were subjected to 104 operative procedures with a mortality of 1.37 per cent.

In the treatment of the staphylococcal urinary antiseptics local treatment to the mucous membrane of the urinary tract and elimination of the foci of infection were indicated. Neosalvarsan was worthy of the first trial. Attempts to dissolve already formed stones and prevent the formation of new ones were made with urinary acid secretion regulation of the renal pelvis with acid solution treatment of the disturbed calcium metabolism colloid therapy and the administration of vitamins. The procedures to facilitate the spontaneous passage of the stone were the same as those used in lithiasis in general.

ANDREW McNALLY M D

to pressure on overlying soft tissues, inflammation of the overlying bursa, or to superimposed malignant changes in the tumor. Roentgenologically these tumors appear as either sessile or pedunculated outgrowths from the bones, the ends being almost invariably bigger and broader than their shafts. The free end of the exostosis is capped by cartilage which, though normally invisible in the roentgenogram, is of great importance. Owing to the paucity of pathological data, views expressed as to the origin of these tumors are based on theory, the most reasonable explanation being that in the process of growth a portion from the edge of the metaphyseal cartilage becomes detached and displaced on to the surface of the shaft, and this fragment continues to grow independently. Unless malignancy supervenes growth normally ceases at the same time as metaphyseal growth in the parent bone ceases and the cartilaginous cap becomes ossified. The theory advanced by Keith and supported by Hume to account for the formation of "multiple exostoses" is equally applicable in a more localized way to the "single exostosis."

The condition variously known as "multiple exostoses," "diaphyseal aclasis," or "hereditary deforming chondrodysplasia" is a disorder of growth which is hereditary and which may affect several individuals of the same family. It affects only bones laid down in cartilage which have become covered by periosteal bone, such as the long bones or the scapula. The condition usually becomes manifest during the period of active growth. Palpable tumors of varying sizes are usually found in the affected parts, and pain and dysfunction may result from pressure of the growth. This pressure may be so great as to cause paraplegia, local paralysis, or even an aneurysm. Local exacerbation of symptoms in patients over thirty years of age may be the first indication of malignant developments.

The more common clinical features are a shortening of stature with bowing of the forearms and legs, usually roughly symmetrical, and sometimes deformity of the phalanges. Roentgenologically, the metaphyseal ends of the bones are broadened and their internal structure is grossly changed. Multiple osteochondromas, usually with broad bases and pointed tips, are found. The cortex is thin and the medullary spaces wide, irregular, and translucent. The bones of the forearm and lower leg are bent, the ulna and fibula are usually shortened, and subluxations at the wrist, elbow, and ankle are frequently present. The epiphyseal axis is often distorted. When the osteochondromas protrude between adjacent bones, one or another of these bones may show absorption from erosion, or local fusion may occur.

Chondromas are cartilaginous growths occurring usually between the ages of twenty and thirty years, and may be either single or multiple. The single chondroma is a benign tumor occurring most frequently in the phalanges of the hand or foot, in a rib near the costal cartilage, in the sternum, pelvic bones, scapula, occasionally in the spine, and rarely

in the skull and long bones. If the chondroma has arisen in the central portion of the affected bone it appears roentgenologically as a well defined translucent area surrounded by a bony capsule; if the chondroma is large the cortex may be thinned and expanded and trabeculation may be present in the translucent area. If it arises in the cortical bone, the latter is destroyed so as to present a depression in its surface, while the more superficial aspect of the tumor is seen as a round faint shadow protruding into the soft tissues and deforming the outline of the affected part. Whenever the growth has perforated the surface of the bone or penetrated into the soft tissues, relics of the original cortical covering are seen as bony flakes of varying sizes on the periphery of the growth. Pathological fractures are seen frequently, particularly if myxomatous degeneration has taken place in the chondroma.

Multiple chondromas have the same anatomical distribution as single chondromas, but they may also be found in the long bones. Because of their occurrence near the epiphyseal lines of the long bones, considerable confusion has arisen regarding the relationship of multiple exostoses and multiple chondromas. Cases in which both coexist are not infrequently seen.

From a correlation of the pathological, clinical, and roentgenological features, the following is presented by the author as a reasonable roentgenological classification of bone cysts: (1) simple cysts, such as solitary bone cysts, multiple cysts, and multilocular cysts; (2) fibrosis of bone, (3) cysts in generalized diseases, such as hyperparathyroidism, osteitis deformans, osteomalacia, xanthomatosis, Gaucher's disease, osteogenesis imperfecta, (4) myxochondromatous cysts, (5) traumatic cysts, e.g., in carpal scaphoid, (6) infective cysts, e.g., dental, (7) developmental cysts, e.g., dentigerous, (8) arthritic cysts; (9) hydatid cysts, and (10) fibromatous cysts, or "chronic fibrous osteomyelitis." The roentgenological appearance of each of these conditions is discussed in detail.

RUDOLPH S. REICH, M.D.

De Orsay, R. H., Mccray, P. M., and Ferguson, L. K.: The Pathology and Treatment of Ganglions. *Am. J. Surg.*, 1937, 36 313

A ganglion may be defined as a cystic benign tumor, filled with a mucoid material, usually surrounded by a thin wall, and occurring in the region of the capsule and connective tissue of joints and tendon sheaths. These tumors usually occur in the second, third, and fourth decades of life, in patients who are generally of slight build. The fact that the greatest number occur in early active life, when trauma is most likely, suggests that trauma may have a definite bearing on the cause. In the authors' series of fifty cases, nineteen patients definitely gave trauma as the cause; twenty-nine were unable to name any specific cause. Only two were certain that trauma had not occurred. The majority of the patients reporting trauma stated that it was associated with a twisting motion.

patient's antihemolysin titer was near its maximum level of 28.8 international units. One patient with a persistent sinus which could not be opened wide because of anatomical considerations developed an extensive and long lasting pyoderma and several extensive phagedenic ulcers on the affected as well as on the opposite limb notwithstanding that he received 24,300 units of toxoid and that his antihemolysin titer had increased sixfold. In a patient preventing multiple soft tissue and bone abscesses involving practically every part of the body many new foci developed notwithstanding the administration of 21,300 units of toxoid and a fivefold increase in the antihemolysin titer. The toxoid did not prevent amputation in the middle of the thigh for a postoperative staphylococcal infection of a knee following arthrodesis for tuberculosis even though the antihemolysin titer had risen to four times the original titer. Subsequently the titer rose sixteenfold but the healing of the stump was delayed over a period of three months because of a persistently stubborn infection of the operative wound. The new lesions in most of the other cases consisted of local abscesses several of which occurred in instances in which there was no evident active lesion at the time of onset of toxoid therapy. Erosions of epithelium in healed cases of osteomyelitis were to all appearances not influenced by the action of toxoid.

The author operated on a series of about 150 patients who were submitted to maggot therapy. The only two postoperative mortalities sustained in this series occurred in individuals who were under toxoid therapy. These instances are mentioned to indicate the inadequacy of the toxoid to modify the course of these patients for the better.

Further studies reveal that the original titer had no relationship whatever with the severity of mildness of the local lesion. In addition the serological response was not in any way related to the clinical progress of the case.

In a discussion of the author's observations it is suggested that the disappointing results obtained following the administration of staphylococcus toxoid in chronic osteomyelitis may be attributed to the fact that staphylococci causing this type of infection are of low toxicity and of great invasiveness.

The author believes that immunization in this type of infection should be directed toward the establishment of resistance to the invasiveness of the organism rather than to the production of a purely antitoxic immunity.

NORMAN C. BULLOCK, M.D.

Urrutia G. Biopsy on the Lymph Nodes in the Diagnosis of Osteoarticular Tuberculosis (Biopsia ganglionar en el diagnóstico de la tuberculosis osteoarticular). *Rev de ortop y traumatol* 1937 6

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Urrutia reports the results of his systematic use of lymph node biopsy for the diagnosis of osteo-

articular tuberculosis. Forty-eight such biopsies were done in various diseases of the bones and joints during the past two years at the Hospital Anarria, Santiago, Chile. In the 25 proved cases of osteoarticular tuberculosis the adjacent lymph nodes were involved in 23 (88 per cent). Only a microscopic examination was made. A table is given of the comparative results in these cases of lymph node biopsy with other diagnostic procedures such as the von Igarky and Mantoux tests, radiological examination of the chest and the osteoarticular lesion, cultures from pus when present and biopsy on the focus in surgically treated cases. Five other cases in which lymph node biopsy contributed greatly to the clearing up of a difficult differential diagnosis between tuberculosis and other conditions are presented in detail.

The author's conclusion is that among the methods for diagnosing bone and joint tuberculosis with certainty lymph node biopsy ranks first and cultivation of the bacillus second, with biopsy on the focus itself reserved for the surgically treated cases. Lymph node biopsy is an indispensable method although subject to a certain percentage of error. It is especially valuable for early diagnosis. Only cultures are positive only when pus is present. In choosing the node for excision meticulous palpation is essential as the most involved node does not always occupy the same situation. Lesions of the hip give the most uncertain results and in cases of this kind it is advisable to excise both an inguinal and an iliac node. In one of the author's cases fistulization of a cold abscess occurred through the biopsy incision and in two other cases there were tuberculous granulations but these complications were not serious.

M. E. Moxon, M.D.

Roberts R. E. Some Observations on Osteochondromas, Chondromas and Cystic Diseases of Bone. *Bull J Radiol* 1937, 10 196

The nature of osteochondromas, chondromas and cystic diseases of bone has long interested anatomists and pathologists. In this article the roentgenological findings are interpreted in the light of such facts and theories as are available, an attempt being made to correlate the roentgen ray appearance of these conditions with their underlying pathology.

Osteochondromas consist of varying proportions of bone and cartilage which may arise in connection with any portion of bone or cartilage or occasionally fibrous tissue. Attention is concentrated on types of osteochondroma associated with the diaphyseal cartilage of bones, namely, the so-called single exostoses and the condition which has commonly been known as multiple exostoses but which in the future will probably be termed more correctly diaphyseal aclasis or hereditary deforming chondrodysplasia.

The condition known as single exostosis is a benign osteochondroma found growing near the ends of a long bone. Clinically it may give rise to pain but unless it has been fractured the pain is usually due

to pressure on overlying soft tissues, inflammation of the overlying bursa, or to superimposed malignant changes in the tumor. Roentgenologically these tumors appear as either sessile or pedunculated outgrowths from the bones, the ends being almost invariably bigger and broader than their shafts. The free end of the exostosis is capped by cartilage which, though normally invisible in the roentgenogram, is of great importance. Owing to the paucity of pathological data, views expressed as to the origin of these tumors are based on theory, the most reasonable explanation being that in the process of growth a portion from the edge of the metaphyseal cartilage becomes detached and displaced on to the surface of the shaft, and this fragment continues to grow independently. Unless malignancy supervenes growth normally ceases at the same time as metaphyseal growth in the parent bone ceases and the cartilaginous cap becomes ossified. The theory advanced by Kerth and supported by Hume to account for the formation of "multiple exostoses" is equally applicable in a more localized way to the "single exostosis."

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The more common clinical features are a shortening of stature with bowing of the forearms and legs, usually roughly symmetrical, and sometimes deformity of the phalanges. Roentgenologically, the metaphyseal ends of the bones are broadened and their internal structure is grossly changed. Multiple osteochondromas, usually with broad bases and pointed tips, are found. The cortex is thin and the medullary spaces wide, irregular, and translucent. The bones of the forearm and lower leg are bent, the ulna and fibula are usually shortened, and subluxations at the wrist, elbow, and ankle are frequently present. The epiphyseal axis is often distorted. When the osteochondromas protrude between adjacent bones, one or another of these bones may show absorption from erosion, or local fusion may occur.

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RUDOLPH S. REICH, M.D.

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A ganglion may be defined as a cystic benign tumor, filled with a mucoid material, usually surrounded by a thin wall, and occurring in the region of the capsule and connective tissue of joints and tendon sheaths. These tumors usually occur in the second, third, and fourth decades of life, in patients who are generally of slight build. The fact that the greatest number occur in early active life, when trauma is most likely, suggests that trauma may have a definite bearing on the cause. In the authors' series of fifty cases, nineteen patients definitely gave trauma as the cause, twenty-nine were unable to name any specific cause. Only two were certain that trauma had not occurred. The majority of the patients reporting trauma stated that it was associated with a twisting motion.

In the authors experience the excised ganglia have varied in size from a tiny globule 0.5 cm in diameter to a mass which measured 6 by 3 by 2.5 cm. They may be solid or show various degrees of cyst formation. If multiloculated the loculi may be of approximately the same size or there may be one large and several smaller loculi. The contents are usually colorless. The consistency varies rarely it may be fluid, but more commonly it has the viscosity of glairy mucus.

The authors have been able to confirm King's idea that these masses appear first as a solid tumor with later formation of longer cysts caused by the disappearance of the intercystic septa.

Staining methods show that the contents of ganglia are myxoid rather than mucinous and therefore the process is one of degeneration of collagen fibers rather than secretion of connective tissue cells as suggested by King.

The most prominent symptom is the presence of a mass. Pain is variable and is dull in character.

Depending on their content ganglia may be tense and firm to palpation or soft and fluctuant. They may be of bony hardness when the wall is thick and the contents a emollient gel or they may be fluctuant especially when multilocular. They are usually attached to the deeper underlying structures and may be felt to move on motion of the neighboring joint or with the involved tendon sheath.

The ganglia are treated for three reasons: (1) to remove the unsightly mass, (2) for relief of the feeling of weakness often noted in the part in which the ganglion is present, and (3) for relief of the pain or soreness which frequently accompanies the ganglion.

Three methods of treatment are used by the authors: they are rupture, aspiration, and excision.

Rupture with dispersion of the contents of the ganglion has been regarded as the most conservative method of treatment. The rupture is accomplished by striking the ganglion sharply with a heavy object usually a book. This method is applicable only to ganglia which may be made prominent such as those on the dorsum of the wrist. No anesthesia is required. After the ganglion is ruptured the area is massaged so that the gelatinous contents may be dispersed and absorbed in the surrounding subcutaneous tissues. This form of treatment was carried out by the authors with the knowledge that recurrence may take place but since a cure was obtainable by simple rupture in at least one half of the cases it seemed that this conservative treatment was worth at least one trial.

Treatment by aspiration of the ganglionic contents has been disappointing. In many cases the content was of such a firm jelly like consistency that aspiration was unsuccessful. In other cases the multilocular character of the ganglion made it difficult to be certain that the contents were entirely evacuated even though some of the gelatinous material could be removed.

The most successful treatment in the authors' hands has been careful dissection and excision of the ganglion. A tourniquet was used when it was possible to produce a bloodless field. The operation could be performed under local infiltration anesthesia. The ganglion was separated from the surrounding tissue by blunt and sharp dissection. The authors felt that it was wise to excise a fairly generous amount of the surrounding tissue at its base as they believed this to be the best insurance against recurrence.

If the capsule of the joint or a tendon sheath was opened it was carefully closed with interrupted sutures of fine catgut or silk. A firm compression bandage was applied and the part splinted when possible.

The authors obtained a cure in 93.3 per cent of the cases by this type of therapy.

NORMAN C. BULLOCK, M.D.

Navratil E. and Kramer A. Endometriosis in the Arm Musculature (Endometrium in the Arm Musculature). *Alin. Wochenschr.* 1935 2 1965

For a half year without any previous injury or over exertion the authors' patient suffered slight dull pains in the outer part of the right elbow joint. These lasted several days and occurred regularly during the menses. Simultaneously with menstruation the affected arm was 1.5 cm greater in circumference than the normal arm. During extension a slight mass became visible at the level of the radial head. There were no signs of inflammation. In the musculature there was found a mass the size of a pigeon egg which was somewhat movable, painful to touch, had no sharp demarcation and yielded on pressure. The elbow joint was not involved except for a slight extensor defect and moderate pain during maximal extension. During the intermenstrual period the size of the tumor decreased by half. It felt coarse but was not so painful to touch. The elbow joint was entirely normal. The dependence upon menstruation of the pain, the increase in size and the other changes in the mass was established by the administration of luteal hormone which postponed the menses nine days. The roentgenogram showed a shadow of the soft parts at the site described. The bones and joints were not pathologically altered. The tumor was excised. Histological study revealed an endometrioid fungoid mass at quite a distance from the blood and lymph vessels with well preserved transverse striation of the musculature at its margin. The diagnosis was ectopic endometriosis. No discomfort was experienced after the excision of the tumor.

The authors then discussed minutely the differential diagnosis which involved intermittent tubercular joint hydrops dependent upon ovarian cycles, joint neuralgias appearing during menstruation, myxoma, neurofibroma, joint ganglion and lymphoma. Next they discussed the cases reported to date and especially their causes. The genesis of the ectopic endometriosis described may be explained

as conforming with the perivascular theory of Halhan. This case should be observed for a long time in the hope of fully establishing its origin.

(SIEGFRIED STELZER) MATHIAS J SEIFERT, M D

Mouchet, A. and Rouvillois, H.: Absorption of the Pelvic Bones of Undetermined Origin (*Ostéolyse du bassin d'origine indéterminée*). *Mém. l'Acad. de chir.*, Par., 1936, 63: 277.

In May, 1912, a girl twelve years of age fell on her left hip while jumping a rope and felt a rather sharp pain. She resumed her activities in an hour but dragged her left leg somewhat. She then remembered that she had had mild pain in the left buttock, thigh, and calf before the accident. In July she had another fall following which she stayed in bed for three days. In October she had a quite decided limp in the left leg and slight muscle atrophy in the same leg. Roentgen-ray examination showed an absorption or "melted away" appearance of the left pubis and ischium, the acetabulum being much enlarged and the misshaped head of the femur displaced inward. There was no fever and the general health was excellent.

The hip was immobilized for about a year, after which the patient was allowed to be up on crutches. In December, 1913, the left leg was very much shortened. Blood and urine examination were negative. Consultants were puzzled. One of them made a diagnosis of "congenital arrested development of the pelvis." By the middle of 1915 the patient was walking with a cane but the left limb was becoming more and more defective, and the femoral head penetrated into the pelvis. The hip was flexed partially and the knee was in valgus. On palpation, the normal resistance and solidity of the ischium and pubis could not be felt on the left side. All motions in the hip were sharply limited. In 1932 roentgen-ray examination showed a very slight reconstruction of the left pubis and ischium, the acetabulum, however, had completely disappeared and the trochanter rested against the roof of its remains.

Another case, similar to the above, was that of a young man who had complete absorption of the metacarpals of the left hand, partial absorption of the carpal bones and of the phalanges of the index finger. Although the hand lacked rigidity, it had fairly good function.

A case somewhat similar was reported by Simpson in 1937. The patient was a girl who injured her foot in a fall. The original roentgen-ray examination showed nothing abnormal, but nearly a year later, because of persistent symptoms, another roentgenogram was taken. It showed extreme decalcification and fracture of the fifth metatarsal, and partial decalcification of the third and fourth metatarsals, the cuneiforms, and the scaphoid. The blood calcium was normal. A biopsy showed fibrous degeneration of the bone structure. This condition progressed until about ten years later when the absorption of the third, fourth, and fifth metatarsals was complete and the lesion had spread to all the other bones of



the foot. In spite of all this, the foot retained fairly good function, the patient being able to dance and play golf.

In none of these cases was the progress of absorption influenced by immobilization, endocrine therapy, and sympathectomy. Even after ten years there is no assurance that the absorption will not continue.

WM ARTHUR CLARK, M D

Léveuf, J. and Bertrand, P.: Arthrography in Congenital Dislocation of the Hip (*L'Arthrographie dans la Luxation Congénitale de la Hanche*). *Presse méd.*, Par., 1937, 45: 437.

In spite of the publication of encouraging results, arthrography has not yet been generally accepted in France. In congenital dislocation of the hip it seems that it should give us valuable information regarding the shape of the capsule. In a true dislocation the capsule is in two parts, the cephalic chamber and the acetabular chamber, which are separated by an isthmus. In the cephalic portion the capsule may be as much as 1 cm. in thickness. The acetabular part is often adherent to the articular surface, giving the impression that the acetabulum is filled up. Arthrography may show such adhesions and may be the deciding factor in the determination whether an open reduction should be done, or it may show the reason for failure after an attempt at closed reduction.

Various opaque solutions or oils may be used for injection, or the capsule may be blown up with oxygen. In young children a general anesthetic is necessary, but in older children the injection may be given under a local anesthetic. An attempt at closed reduction may be combined with the injection, under the same anesthetic. The opaque solution is injected through a long needle which is inserted just anterior to the greater trochanter until it touches the head of the femur. The amount which can be injected varies from 2 to 10 cc. After

the injection the joint should be moved gently and a roentgenogram taken at once. If the fluid cannot be injected after insertion of the needle the chances are that the point of the needle has penetrated the spongy bone of the head. On the other hand if it injects too easily the needle may be outside of the capsule. No harm has ever come from the injections.

A normal joint will hold only 1 or 2 cm. of the fluid and the picture in such a joint will show a crescent shaped opacity concentric with the head of the femur its upper limit being the upper margin of the acetabulum and its lower limit the obturator foramen.

In a dislocated hip the cephalic portion of the capsule will show as an opacity surrounding the head of the femur and the acetabular portion as a much smaller opacity the two being connected by a narrow isthmus of opacity. If the isthmus is obliterated by adhesions as may be in old cases the acetabular portion will not be filled with the fluid and therefore will not show in the roentgenogram.

In two cases reported in this paper the cephalic and acetabular parts of the capsule communicated with each other. In seven cases they were separated only by a very narrow isthmus. In two of these seven cases a reduction by the closed method had been tried without success. In four of them an open reduction has been or will be done without first traumatizing the tissues by attempting a closed reduction.

Two cases showed a completely isolated cephalic capsule as the fluid had not penetrated into the acetabular part. These occurred in older children with irreducible dislocations.

In cases which have had successful closed reductions the roentgenogram after the injection of the opaque fluid shows an almost normal contour of the capsule cavity.

Arthrography may thus show the degree of reducibility the defects in an imperfect reduction and the indications for an open reduction and may serve as a guide in operative technique of a surgical reduction.

Wm. Arthur Clark, M.D.

Fairbank H. A. T. Internal Derangement of the Knee in Children and Adolescents. *Proc Roy Soc Med Lond* 1937 30 421

Fairbank presents the chief differences between a series of 63 cases of internal derangement of the knee joint in young patients and cases of this condition in adults. In 36 abnormal or damaged cartilages the external cartilage was involved 23 times a ratio of 1.8 to 1 in the adult cases those of patients of twenty years and over the ratio was 1 to 2.7. Of the 23 external cartilages which were involved 13 (56 per cent) were considered congenitally abnormal. Anatomically the cases fell into three groups:

1. Those with a discoid cartilage which shows no suggestion of the usual crescentic shape but forms a more or less complete circular disc lying in the outer half of the joint.

2. Those with absence of the posterior half of the cartilage the anterior half being abnormal in shape and thickness and forming a semicircular half-disc.

3. Those with a reversed cartilage. Although not abnormal in shape it was attached medially to the tibia instead of laterally and the free concave border was directed outwards instead of inwards. The results of complete excision of these abnormal cartilages seemed to be good.

JEROME G. FINER, M.D.

Leinati F. Apophyseal Dystrophy of the Os Calcis (La distrofia apofisaria calcaneare). *Chir d'organi ds movimento* 1937 22 405

This article is accompanied by roentgenogram and a bibliography and is based on the four cases which Leinati has seen during the past few years at the Surgical Clinic of the University of Pavia. A summary of the most important Continental literature is given and also a historical review of the recognition of apophysitis in various localizations and the consequent unification of the disease concept. The best name for the condition appears to be apophyseal dystrophy as it is applicable to any site and is the most suitable for international comprehension and bibliographical purposes.

Although only 114 case reports of apophyseal dystrophy of the os calcis were collected by Wilster in 1932 it is probably relatively common. Leinati discusses its etiology pathology symptomatology course treatment and roentgenological diagnosis. In contrast to the previous uncertainty, most authors now agree that the roentgenological appearances are closely connected with the disease if not pathogenomic and that if they are correctly interpreted the disease can be recognized and differentiated from other affections. In exceptional cases children without symptoms may have isolated signs indicating apophyseal dystrophy but never the complete roentgen ray picture. The roentgenological signs precede the clinical and persist during intermissions and for some time after clinical cure. Trauma or excessive fatigue may precipitate the pain although the roentgen ray picture does not show an acute condition. The roentgenological changes are always more or less bilateral although because of the trauma the symptoms may be unilateral.

The author's general viewpoint is that this condition belongs to the large group of growth dystrophies which under various names and in different locations have in common the age at which they appear their cause pathology symptomatology roentgenological appearance and clinical course. Apophyseal dystrophy of the os calcis arises exclusively in the period between the appearance of the second nucleus of ossification and its union with the rest of the bone. Its origin is not completely clarified because of the scarcity of histological examinations but our present knowledge indicates that the disease is due to multiple factors circulatory endocrine and particularly toxic and infective which together with a mechanical stimulus may cause subchondral necrosis of the spongy epiphysal bone.

accompanied later by alterations of the metaphyseal cartilage and the periosteum. These lesions constitute a *locus minoris resistentiae* in which bacteria may lodge and set up an infective apophysitis, ranging from the mild type, which is indistinguishable except for the temperature from growth dystrophy, to the fatal suppurative form. The essential and differential characteristics of the disease are the patient's age, pain localized at the insertion of the Achilles tendon, loss of function, the roentgenogram, and disappearance of the symptoms with rest.

Phosphorus and arsenic and calcium-vitamine treatment are indicated. The author has had excellent results with thyroid extract, although pluri-glandular therapy is preferable. In very prolonged or painful cases, more or less extensive removal of the superficial cartilage may have to be considered.

M E MORSE, M D

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Raiga, A. Cure, with Bacteriophage, of a Case of Acute Osteomyelitis Which Had Grown Worse in Spite of Three Successive Operations (Guérison par la phagothérapie d'une ostéomyélite aiguë continuant à évoluer malgré trois opérations successives) *Bull et mém Soc d chirurgiens de Par*, 1937, 29 42

A boy eight and one-half years of age fell January 25, 1935, and skinned his left knee. About a week later he had a fever of from 38° to 39° C and pain in the lower part of the right leg and in the right forearm. He rapidly became worse until delirium came on. Ten days after the injury, a surgeon made a diagnosis of osteomyelitis.

At operation pus was found under the periosteum at the lower part of the right tibia. Trepanation of the cortex revealed no pus in the medullary cavity. Anti-staphylococcus-vaccine treatment was started. The second operation was done on February 7. A wide opening was made in the tibial cortex and the ankle joint opened. Thick pus was found. At the third operation February 24, an abscess over the side of the os calcis was drained. The leg was immobilized in a plaster cast. The temperature varied from 38° to 39° C.

On March 1 the child was very pale and emaciated. Profuse drainage of pus continued from the wounds on the leg and both sides of the ankle. The distal end of the right radius was tender. The temperature was 39.3° , the pulse 125 and feeble. The hemoglobin was only 60 per cent, the red cells numbered 3,200,000, and the leucocytes 10,200. The roentgen examination showed an irregular tibial cortex with a great deal of the anterior part gone, the epiphyses were intact, and there was an osteitis of the distal tibial metaphysis and of the os calcis. The general condition was very bad. The problem was to save the child's life. Amputation was decided upon, and preparation for the operation was made, a blood transfusion was given.

In the meantime, irrigation of the wounds with a bacteriophage had been started and a slight improvement was beginning. Amputation was therefore postponed and the bacteriophage continued. By March 15 all immediate danger seemed to be over. The temperature did not go above 38° , the hemoglobin was 80 per cent, and the red-cell count was 4,220,000. On April 8 an intravenous injection of 5 c cm of a staphylococcus bacteriophage in 100 c cm. of normal salt solution was given. This caused a rise of temperature to 39.5° , but about twelve hours after the injection the temperature was down again. This confirmed the laboratory findings regarding the specific action of the bacteriophage.

The child was able to leave the hospital on June 13 and from then on made a good recovery. By August 11 the wounds with the exception of a slight sinus over the os calcis were healed. The tibia regenerated to practically normal shape.

This case illustrates three methods of treatment: surgery, vaccine treatment, and bacteriophage treatment. The question whether the early trepanning of the cortex caused infection into the medullary canal may be raised, but proof that it did is lacking. The clinical course and temperature curve indicate otherwise. As for the vaccination, this is a case in which the vaccine did not vaccinate. At the end of a month the clinical signs did not offer much hope of a cure. At this time the patient was not in condition to stand major surgery, especially in view of the syncope following the third operation. Amputation was also contra-indicated by the metastatic infection already localized in the right radius. It seemed best to fight against the cause of the infection rather than to remove the results of it.

The author cites a case from the literature in which after three successive surgical interventions an amputation of the leg was done to save the patient from septicemia. This patient had one intravenous injection of bacteriophage which caused an amelioration of symptoms. Another patient with septicemia from staphylococcus prostatitis made a rapid recovery after one such intravenous injection.

The modification of the anti-bacterial resistance of a patient by "phagotherapie" gives a chance of foreseeing complications and effecting a true cure.

WM. ARTHUR CLARK, M D

Dickson, F. D.: Fascial Transplants in Paralytic and Other Conditions. *J Bone & Joint Surg*, 1937, 19 405

Stimulated by the recent work of Lowman in 1932 and Mayer in 1936, Dickson presents methods designed to manage paralytic deformities of the spine and trunk. Eight patients with paralysis of the quadratus lumborum, among forty-four with abdominal plastic repair, were benefited generally and locally by the use of a fascial transplant, which extended from the erector spinae muscles opposite the first lumbar spinous process, obliquely downward and laterally to be fixed into the crest of the ilium (Figure 1).



Fig. 1 Fascial transplant to replace the paralyzed quadratus lumborum

Fascial transplants about the shoulder for the purpose of stabilizing the scapula preventing or minimizing deformity of the chest and the cervical region, and improving the function of the muscles of the upper extremity proved useful in two types of cases: (1) paralytic scoliosis with drop shoulder and



Fig. 3 A Fascial transplant from the lower vertebral border of the scapula to the spinal muscles. B Fascial transplant from the lower vertebral border to the latissimus dorsi muscles

marked cervical curvature (2) paralysis of the scapular muscles with asymmetry of the shoulder deficient stability of the shoulder girdle and development of a high thoracic curve

In the first type the object was to elevate the dropped shoulder and to provide a fixator action against the pull of the unparalyzed muscles on the convex side of the cervical curve which was concave toward the side of the depressed shoulder. To accomplish these two objectives two fascial strips were used: one was passed from the spine of the scapula to the cervical muscles on the concave side of the cervical curve; the second was passed from the spine of the scapula to the spinous process of the first thoracic vertebra (Figure 2). The procedure was carried out in six cases. Following operation the shoulder remained elevated quite satisfactorily with out support; the neck pain disappeared and there was a very satisfactory increase in the range of neck movement. Four cases were observed for three years and two for two years after operation.

In the second type paralysis of the scapular muscles an attempt was made to correct the instability of the scapula due to weakness of the muscles running from the spine and trunk to the scapula. To replace the action of the paralyzed serratus anterior which was most often affected a fascial transplant was fastened in a slot made at the lower axillary border of the scapula and passed forward through a subcutaneous channel. The distal end was split and one section was laced into the lower fibers of the pectoralis major and the other into the anterior fibers of the latissimus dorsi; the fixation was made



Fig. 2 A Fascial strip running from the spine of the scapula to the cervical muscles. B Fascial strip running from the spine of the scapula to the spinous process of the first thoracic vertebra

with the scapula drawn forcibly toward the axilla and the fascial strip under strong tension. In a second case the deformity was due to overaction or unresisted action of the serratus anterior and weakness of the rhomboidei and levator scapulae. Stabilization was secured by passing a fascial strip from a slot in the vertebral border of the scapula inward and slightly downward and lacing the distal end into the spinal muscles, a second strip was passed downward and slightly outward into the latissimus dorsi, into which it was anchored in like manner (Figure 3). These transplants anchored the scapula well against the chest wall and prevented any lateral movement. The result in this case after three years has been restoration of practically normal use of the shoulder and arm, and no increase in what had been, previous to operation, a progressive lateral deformity of the upper thoracic spine.

JEROME G. FINDER, M.D.

FRACTURES AND DISLOCATIONS

Michel, L.: Obstetrical Dislocation of the Upper Humeral Epiphysis (Le décollement obstétrical de l'épiphyse supérieure de l'humérus) *Rev d'orthop*, 1937, 24, 201

Most authors writing of obstetrical injuries to the arm and shoulder have in the past denied the possibility of dislocation of the upper humeral epiphysis in the newborn. Recently several reports have appeared in the French and Italian literature confirming the opinion that this is a definite clinical condition, which must be differentiated from other types of injury in that region.

Statistics as to its frequency are unreliable because an incorrect diagnosis is possible even when roentgenograms have been made. Another confusing factor is that displacement of the epiphysis is often associated with obstetrical paralysis or other injury. Fracture of the diaphysis is much more frequent than dislocation of the epiphysis.

Dislocation of the superior humeral epiphysis may occur when delivery has been performed by podalic version or when difficulty is encountered in extraction of the arm in considerable dystocia. The author discusses at some length the anatomical peculiarities of the shoulder, the epiphysis, and the diaphysis which predispose to this type of injury.

The dislocation may be partial, or sub-periosteal, or complete when there is a large periosteal tear accompanied by subluxation of the diaphysis. The partial dislocation is found mostly.

In incomplete dislocations the arm is not used so that it simulates a flaccid paralysis. There is a state of contracture at the shoulder and the arm is fixed in a position of internal rotation against the trunk with the forearm in extreme pronation. Palpation is painful, abduction or external rotation is limited.

In complete dislocations there is painful swelling with deformity of the upper arm. The upper end of the humerus is felt in an abnormal location, as in dislocation of the shoulder.

A differential diagnosis must be made from (1) diaphyseal fracture, (2) simple contusion, (3) obstetrical paralysis, (4) acute epiphysitis, (5) pseudo-paralysis of Parrot, or syphilitic osteochondritis, (6) congenital luxation of the shoulder, and (7) congenital dystrophy of the arm and shoulder.

Consolidation takes place in from fifteen to twenty days. When the displacement is not reduced gradual improvement in motion takes place but some deformity or limitation persists.

Treatment consists of immediate reduction which can usually be effected by rotating the arm externally and fixing it in 90° abduction at the shoulder with the elbow flexed at a right angle.

When the displacement is internal and downward, the arm is fixed against the trunk using a Velpeau bandage in the usual manner except that a pad is placed between the arm and the chest and the hand should not be placed against the opposite shoulder. The splint should be left on eight days, then removed once a day for a month to care for the skin. It should be worn at night for several months.

If the diagnosis has not been made during the first week, traction with weights must be used because of callus formation. In neglected cases, osteotomy with rotation of the humerus must be performed.

MARSH W. POOLE, M.D.

Buergi, S. A Contribution to the Study of Luxations of the Os Innominatum (Contribution à l'étude des luxations de l'os coxal) *J de chir*, 1937, 49, 536

Unilateral luxations of the sacro-iliac joint are rare without disturbance of the symphysis pubis. Bilateral luxation is still more rare. Luxation of all three synchondroses may occur without fatal termination.

Omitting lesions of the sacral joints and the coccyx, and considering only the joints of the true pelvic ring, the author concurs in the classification of Malgaigne, except for the sixth variety, as follows: (1) disjunction of the symphysis pubis, (2) luxation of the os innominatum upward, (3) luxation of one sacro-iliac joint, (4) luxation of both sacro-iliac joints, (5) luxation of all three symphyses. The question whether or not a luxation of the symphysis pubis may occur without disturbing the sacro-iliac joints is still discussed. Many clinicians think this can happen. Westborn says that a movement of less than 15 mm. can take place at the symphysis without movement at the sacro-iliac joints, but a movement of from 15 to 30 mm. will cause tearing of the anterior sacro-iliac ligaments. A displacement of from 40 to 80 mm. in front will cause decided displacement behind.

The traumatism causing these luxations is usually violent, for example, a fall from a horse or a high place, or being run over by a vehicle. However, luxation has been known to occur as a result of severe sprain or a twist of the pelvis, as occurs when an attempt to maintain equilibrium is made. A woman had a luxation when a strong wind caught

the umbrella she was carrying and caused her to exert a sudden muscle contraction to recover her balance.

The position of the thighs at the time of the accident is a factor in the mechanism. Often the thighs are abducted which predisposes to a dislocation of the symphysis or the patient may have been on his face one hip acutely flexed the other hyperextended when run over by the wheels of a vehicle. There may be a predisposition as in the case of a pregnant woman in whom all the ligaments in the pelvic ring are relaxed or that of a person with both hips ankylosed so that abduction is impossible and the yield takes place at the symphysis. Miners seem to furnish a large number of cases of pelvic luxations.

The author brings up the question whether there is a special mechanism which produces these luxations in counter distinction to fractures of the pelvis. Some think that anterior posterior or longitudinal directions of the traumatizing force will produce the luxations while a transverse force will cause fractures. An oblique or rotating direction of force is also more likely to result in a dislocation than a fracture. It is claimed by some authors that the luxation of the symphysis always precedes that of the sacro iliac joint but Buerger doubts this.

Although some surgeons question the correctness of calling the sacro iliac junction a joint it must be admitted that it has all the anatomical characteristics of a joint viz cartilaginous surface synovia capsule ligaments and a certain amount of motion. The symphysis pubis also has the characteristics of a joint although rudimentary. The term luxation is used in the sense that the articular surfaces are not in normal contact although complete contact is not lost. For instance in a luxation of the entire or in nominatum outward the anterior surfaces of the joint lose contact while the posterior margin does not. A normal anatomical position of the surfaces even after a severe lesion of the joint cannot be called a luxation. The posterior ligaments of the sacro iliac junction are rarely torn. It has been said that these luxations occur more often on the right side than on the left but in 71 cases the author found 36 on the left and 35 on the right.

As to the symphysis pubis the author prefers the name disjunction rather than luxation in cases where there is neither displacement nor retention in abnormal position even when all the ligaments are ruptured.

In the majority of cases of luxation the os in nominatum is displaced upward and there is usually a rotation either outward and backward or inward and forward.

The patient may be in shock or perhaps unconscious but in most cases there is no shock. The patient cannot walk or bear weight on the affected side. Later there is a limp not unlike that of congenital dislocation of the hip. Ecchymosis is usually present and the hematoma may be so large as to interfere with palpation of the bones. The iliac crest may be raised on the affected side and the thigh is

often in abduction. There may be a lengthening of the distance from the antero superior spine to the malleolus on the injured side. On palpation one may be able to detect a separation at the symphysis pubis. In rare cases there may be an abnormal mobility of the pelvic bones. Active motion in the neighborhood of the injury is sharply limited by extreme pain.

Abrasions lacerations or deep wounds of the soft parts may occur and may result in infection and osteomyelitis. One case of laceration of the femoral blood vessels is recorded. Fractures of the rami of the pubis or of the sacrum may be present. Anesthesia may supervene due to lesions of the obturator or of the sciatic nerve. Injury to the bladder is not so frequent as in fractures of the pubis but there is often a retention of urine or hematuria. In 71 cases a rupture of a ureter was noted twice.

The difficulty in diagnosis is to distinguish between luxation and fracture. Abnormality in shape and mensuration suggests the former. Even crepitation may be present in luxation without fracture. Roentgen ray examination will be the deciding procedure.

Statistics on prognosis are, in general too favorable. Fatty embolism may cause death. Other causes of death are rupture of the vessels and hemorrhage shock rupture of a ureter and septicemia. Later mortality may be due to trophic disturbances intestinal obstruction or postoperative complications. One patient died eight months later in labor and instrumental delivery. In general the mortality is about 9.5 per cent. Most of the patients have a limp for a long time. Loss of symmetry of the pelvis may result in obstetrical difficulties.

In uncomplicated cases the problem is only to reduce the dislocation and immobilize the hip until consolidation is complete. Work should be done primarily on the sacro iliac joint in the manipulation for reduction then if the symphysis pubis still remains separated special attention must be given to it. Continuous extension is used for reduction by some surgeons but the results of this method are not always satisfactory. Direct skeletal fixed traction on the ilium by means of a Thomas splint may be effective. A tight plaster cast may be applied from both knees to the chest. After the cast in the midline is cut hooks and ratchets may be applied to pull the dislocated side down the counter pressure being furnished by the opposite side. Peabody ties the foot of the injured side to the head of an operating table then tilts the table so that the body hangs down and with the patient in this position he performs the manipulative reduction.

For maintaining the reduction the best method is continuous traction. Casts are not satisfactory because the luxation may recur while the cast is being applied. In some cases it may be necessary to hold the position by operative internal fixation of the sacro iliac joint. Retention of the symphysis pubis may require open operation but it is wise to delay this procedure until the hematoma has subsided.

The rare cases of downward dislocation are easily reduced, in fact, the reduction sometimes is spontaneous

WM ARTHUR CLARK, M D

Muller, C. O.: A Contribution to the Question of End-Results of the Bloodless Treatment of Congenital Dislocation of the Hip. (Beitrag zur Frage der Endergebnisse der unblutig behandelten angeborenen Huftgelenksverrenkung) 1936. Leipzig, Dissertation

The widely conflicting end-results of the bloodless treatment of congenital dislocation of the hip become clarified in part as the periods of varying duration which exist between reduction and follow-up are taken into consideration. The early good results may be questioned since it is possible for subluxation to recur, or for juvenile arthritis deformans to develop after several years. It is premature to speak of an end-result only three years after the beginning of treatment. Two periods of body growth are significant in the development of the reduced hip joint: earliest childhood and puberty. A positive result of the outcome of congenital dislocation of the hip cannot be estimated until after from ten to twenty years of treatment.

In every case the best results are to be anticipated when treatment is begun as early as possible. In 562 cases at the Leipzig clinic, Faber found anatomical cure in 39.9 per cent, a functionally good result in 55.3 per cent, and an unsatisfactory outcome in only 4.8 per cent. The anatomical restoration of the joint is a prerequisite for its subsequent development. The mobility and hereditary defect must be evaluated separately in each case.

(DUNCKER) JEROME G FENDEP, M D

Lee, H. G.: Avulsion Fracture of the Tibial Attachments of the Crucial Ligaments. Treatment by Operative Reduction. *J Bone & Joint Surg*, 1937, 19: 460

In cases of anterior crucial ligament avulsion, proper reduction cannot be brought about by placing

the leg in extension and immobilizing it in this position because the anterior crucial ligament is taut and raises the fragment from its normal bed. Operative excision of the broken fragments is unsatisfactory because it does not repair the instability of the knee joint.

The author's technique of reduction of avulsion fractures of this type is followed through an incision about $\frac{1}{2}$ in. medial to the patella, the patella being dislocated laterally. The cartilages are examined and removed if damaged. Two drill holes are made medially to the patellar tendon and $\frac{3}{4}$ in. below the margin of the tibia. The drill holes should emerge, one on each side of the fractured fragment and, if the fragment is large enough, a drill hole may be made through it transversely. A double suture is passed up through one drill hole in the tibia, then through the fragment or the anterior crucial ligament, and then down through the other hole in the tibia anteriorly and to the outside, where it is securely tied. The usual wound closure is carried out. For about six weeks the leg is immobilized with the aid of a posterior plaster shell, the knee being flexed about twenty-five degrees. At the end of this time physiotherapy is instituted.

During reduction of a posterior crucial-ligament avulsion the patient lies on his abdomen with his leg extended. A longitudinal incision is made in the popliteal space and the gastrocnemius muscle is separated at its point of bifurcation. The arteries, veins, and nerves are retracted laterally. A suture is passed through the ligament proximal to the bone fragment and is attached to the capsular tissues, which procedure holds the fragment in as nearly an anatomical position as possible. The wound is closed in the usual manner. The leg is immobilized for four weeks with the knee slightly flexed, then passive motion is started. Recovery is usually complete within six weeks.

The series of cases presented by this author is small, but the results are good.

RICHARD J BENNETT, JR., M D

SURGERY OF THE BLOOD AND LYMPH SYSTEMS

BLOOD VESSELS

Leishman A W D The Clinical Diagnosis of Polyarteritis Nodosa *Lancet* 1937 232 803

The author presents in detail a report of four recent cases of the rare disease polyarteritis nodosa admitted to St Bartholomew's Hospital London during the last three years. Since first recognized seventy years ago only about 200 cases of this disease have been reported. In none of these were the diagnoses made ante mortem. The author observes that Rokitsansky in 1854 first described this disease condition. The most extensive study was made by Gruber in 1926 based on 113 cases reviewed in the literature.

Polyarteritis nodosa affects the small and medium sized arteries in the following order of frequency: those of the kidneys, heart, liver, the alimentary tract, mesentery, skeletal muscles, pancreas, peripheral nerves, and the brain. Small gray white nodules are seen on the affected artery. Sometimes aneurysms form and may rupture. Thrombosis may occur and the organ supplied by the affected vessel is usually the site of numerous infarcts. It seems that the earliest change is in the adventitia where great aggregations of polymorphonuclear cells together with eosinophils and monocytes are seen. The media undergoes necrosis, the internal elastic lamina ruptures, and there is much proliferation of the intima.

The cause of the disease is still unknown. The clinical course suggests an infection, but all attempts to discover a specific organism have failed. The disease occurs three to four times more often in males. It most commonly affects those aged from ten to forty years.

The author presents a composite clinical picture after reviewing the clinical findings of these four cases and from a survey made of 150 cases previously published. He insists that a more widespread familiarity with the clinical findings will facilitate the diagnosis of this disease, which was heretofore generally recognized only after death. He notes that in order of frequency the complaints are muscular pains, fever, abdominal pains, edema, and general weakness. Leucocytosis of an average figure of from 15,000 to 40,000 per cubic millimeters and occasional eosinophilia occur. The tachycardia is out of proportion to the fever. Because of the colicky pains the abdomen had been surgically explored in many of the patients. Anorexia is frequent and bowel disorders, both constipation and diarrhea, may occur. Evanescent cutaneous nodules that may disappear within twenty-four hours are seen. The most characteristic lesion is a nodule varying in size from a millet seed to a pea, fixed in the skin but moving on the deeper tissues. These nodules are painless and occasionally are purpuric or vesicular.

More rarely and especially in the acute forms of the disease a generalized skin eruption is seen. The basic clinical picture is that of a severe progressive toxemia characterized by fever, muscular asthenia, loss of weight, and anemia.

The disease is almost invariably fatal, and the average duration is from three to four months. No treatment has been found to be of any value.

The author suggests that the possibility of polyarteritis nodosa should be suspected (1) in any illness characterized by severe progressive toxemia, fever, muscular asthenia, and loss of weight; (2) in any illness having the character of an infection but in which there is complete failure to locate the infection; and (3) in any illness in which there are unusual and apparently unrelated combinations of signs, for example, nephritis associated with peripheral neuritis, heart failure, skin rashes, or abdominal symptoms. The diagnosis may often be clinched by a biopsy of the cutaneous lesions or of a skeletal muscle. HENRY F TATAMON M D

Shipley A M Winslow N and Walker W W Aneurysm in the Cervical Portion of the Internal Carotid Artery *Ann Surg* 1937 105 623

The authors present an analytical study of the cases of aneurysm of the internal carotid artery recorded in the literature between August 1, 1925 and July 31, 1936. To the 16 cases reported they add 5 new ones. In addition for the sake of completeness they summarize 20 in which the descriptive matter accompanying does not offer sufficient evidence to warrant a positive statement as to their actual character.

Extracranial aneurysm of the internal carotid artery is not common but it occurs often enough to be borne in mind as a cause of unilateral facial swelling. Its importance lies in its propensity to imitate pontonillar abscess. Mistaken for this condition it has on occasion been lanced with fatal results. The history may be of help in avoiding this error. With rare exceptions the bulging in the lateral pharyngeal wall is accessible both to sight and to touch. To the touch it is soft and elastic and it pulsates throughout its entire extent. Externally there may be no signs of the disease or there may be a boggy area or a distinct lump behind the angle of the jaw over which a bruit may be heard. Both murmur and pulsation disappear when the common carotid artery is compressed against the vertebral column. Dysphagia and dyspnea are common and the patient may complain of tinnitus, hemicrania, vertigo, and weakness. Arteriography has been of diagnostic value in several instances. Spontaneous cure may occur but the usual termination in untreated cases is death from rupture of the sac into the patient's mouth. Ligation of the internal carotid artery is the treatment of choice. If this is

impossible, occlusion of the common carotid artery, together with ligation of the external carotid artery between its origin and its first branch, should be practiced. If the external trunk is tied distal to a branch, the branch must be ligated also. The majority of patients should recover if the aneurysm is promptly recognized and treated. After ligation prognosis is good both as regards operative recovery and permanent cure. WALTER H. NADLER, M D

DeTakats, G., Hick, F. K., and Coulter, J. S.: Intermittent Venous Hyperemia in the Treatment of Peripheral Vascular Disease. *J Am Med Ass*, 1937, 108 1931

The authors analyze the mechanism by which alternating suction and pressure exert their effects on the course of obliterative arterial disease. They found that an intermittent venous stasis in the limb occurred under treatment. The phenomena of the reddening of the toes, the filling of the veins, the rise of surface temperature, and the increased mobility of the toes, all objective changes with passive vascular exercise, can be reproduced by intermittent venous compression. In the study reported the authors have examined this factor, studied its physiological aspects, and appraised the results of its clinical use.

Reports of earlier studies made on the effects of venous congestion are reviewed carefully. Venous congestion as produced for therapeutic purposes causes a relative anoxia in the tissues, followed by the repayment of the oxygen debt, a reactive hyperemia. On the other hand, while arterial occlusion may be used successfully to produce a reactive hyperemia, it is a procedure of questionable value in patients suffering from obliterative vascular disease, or in any instance when used with an inflamed or degenerated vessel. The authors conclude that although reactive hyperemia after arterial occlusion produces an impressive vasodilatation and an increase in temperature, it just barely compensates for the previous asphyxia and in the presence of partially obstructed channels this compensation will not be adequate.

After presenting their observations on intermittent venous hyperemia in respect to blood pressure readings, as well as the determinations of the effects on venous oxygen saturation, the authors discuss the practical application of the apparatus and the method devised by them. Any blood-pressure apparatus may be used to produce intermittent venous hyperemia, but a wide, 8 in. cuff, conically shaped to fit the thigh, is preferable as the pressure is distributed over a large surface and the same amount of pressure that is painful when exerted by a narrow cuff is comfortable. The amount of pressure should not exceed the diastolic pressure of the extremity at that level. It varies between 90 and 60 mm. of mercury in an extremity when the toes are not edematous, cyanotic, ulcerated, nor gangrenous. With such conditions as these, a pressure of 40 mm. of mercury should not be exceeded at first, it may be raised gradually. The

duration of the venous compression is determined by the appearance of a definite rubor; this occurs in from one to two minutes when pressure of from 60 to 90 mm. of mercury is used. The duration of release should exceed that of compression, together with one minute of elevation, which can be kept constant, it should last twice as long as the compression. While the elevation may be active, it is preferable to lift the limb with the help of a pulley. In the average case a cycle is completed in six minutes; two minutes of compression, three minutes of release and one minute of elevation. Ordinarily thirty minutes of this vascular exercise in the morning and thirty minutes in the evening are prescribed. Should the exercise be painful or uncomfortable, either the pressure or the duration of the cycle should be adjusted in order to obtain maximum benefit.

In their evaluation of the results of this form of treatment the authors have selected ten patients from a large group. Although fully conscious of the difficulties in evaluating the effects of any form of therapy in peripheral vascular diseases from their past experience with treatment of definite types, the authors regard intermittent venous hyperemia as a valuable adjunct, an exercise for the home, which can be carried out over a period of months with very little expense and loss of time to the patient. The effect on the mental outlook of the patient should not be overlooked, especially in patients requiring hospitalization for the treatment of their vascular diseases. In addition to enhancing the mental outlook, the home treatment provides in active form the type of exercise which, unless the reserve capacity of the vascular bed is completely exhausted, opens, fills, and stretches the venocapillary bed, and dilates it as far as it will dilate. All the contra-indications to the treatment by suction and pressure that exist are to be observed in treating patients with intermittent venous hyperemia.

HERBERT F. THURSTON, M D

Riddell, V. H.: Peripheral Embolectomy. *Proc Roy Soc Med*, Lond., 1937, 30. 684

The author notes that an embolus in the arterial tree may arise from the pulmonary veins, a vegetation on the mitral valve, a mural thrombus in the left auricle, an atheromatous plaque in the first part of the aorta, or more rarely from one of the systemic veins and a patent interauricular septum. After being dislocated from its site of formation, the first place at which such an embolus may be arrested is at the bifurcation of the abdominal aorta. If it passes the aortic bifurcation, as it usually does, it is liable to become impacted in one of the iliac vessels. Much more often its progress is unhampered until it reaches the termination of the common femoral artery. The termination of the popliteal artery is the last common site of impaction. About 12.1 per cent pass into the upper extremities, and for some reason the left arm is more commonly involved than the right. The terminations of the axillary and the brachial arteries are the common sites of impaction.

When impaction occurs there is intense pain. This bears no exact anatomical relationship to the level of the obstruction. As the collateral circulation develops the pain moves distally. Impaction in the common femoral artery often causes severe pain in the knee joint. Pain pallor and paralysis with absent pulsation of the vessels below the site of impaction are the classical clinical features of this emergency. The point where the pulsation ceases as determined by palpation and auscultation, is the most reliable localizing sign. When emboli block the bifurcations or the origins of large branches of arteries a propagating thrombus usually develops. Changes in the intima cause the embolus to adhere to the vessel wall making its removal more difficult and increasing the probability of a recurrent thrombosis after removal of the embolus. For these reasons the author stresses the importance of early diagnosis and early operation.

The prognosis depends greatly on the time interval after occurrence and before operation. Secondary thrombosis may occur in this interval causing damage to the intima or obstruction of the collaterals. If this interval is less than ten hours there is a 40 per cent chance of survival. After ten hours the mortality percentage mounts steeply. The second factor in the prognosis is the source of the embolus. If it develops from an organically diseased heart the chance of a recurrent peripheral or visceral embolism is always present. In most of the patients the general condition is not suited to any sort of operation. The site of impaction is a third factor in the prognosis. If the embolism is at the bifurcation of the aorta the prognosis is bad whereas if it is in the common femoral artery the prognosis is better. A fourth factor is associated arterial disease as the vessels of the collateral circulation may have to bear the strain of the blood redirected from the main stream. Another factor in prognosis is the accessibility of the vessel for example the common iliac or the femoral arteries are easily accessible in the lower extremities. The prognosis of embolism in the upper extremity is better than that of em-

bolism in the lower extremity, probably because of the freer collateral circulation around the shoulder and elbow joints.

If possible all operations for embolectomy should be done under local anesthesia. The co-operation of the patient by a voluntary statement from him regarding the improvement following the embolectomy constitutes the only reliable evidence that all obstruction has been relieved. These patients are usually quite unsuited to any form of general anesthesia. The author is of the opinion that if the time interval is short it is worth while to avoid arteriotomy and try to clear the main channel instead by displacing the clot by extra arterial massage into a subsidiary branch. If the clot is adherent it will be impossible to remove it by this procedure. Another factor which influences the treatment is the ease of access. If possible, a direct embolectomy at the site of impaction should be done if this is difficult, an indirect embolectomy may be preferred and the arteriotomy wound is made at an accessible point distal to the obstruction.

The author describes a classical embolectomy at the bifurcation of the femoral artery. While the operation is in progress the wound is kept saturated in 2 per cent sodium citrate. If the repair by suturing narrows the lumen of the vessels after embolectomy of a small artery such as the brachial the author advocates the ligation of the artery to make certain that the collateral circulation will remain free from subsequent blocking by thrombus.

The writer concludes by stating that embolectomy is certainly worth doing. There is a 40 per cent chance of survival as opposed to a 90 per cent certainty of gangrene development if embolectomy is not done. Moreover the collateral circulation is reestablished by removing the dangerous secondary extensions of the clot. The intolerable pain can be relieved even if the limb is not saved. By limiting the area of the gangrene amputation may be done in a lower site. Finally the treatment should be as simple as possible especially in the case of inaccessible emboli. HERBERT F. THURSTON M.D.

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE; POSTOPERATIVE TREATMENT

Fallis, L. S.: Postoperative Wound Separation: Review of Cases. *Surgery*, 1937, 1 523

The writer reports a series of cases of wound disruptions from the Henry Ford Hospital. The incidence of postoperative wound separation in 50 of 7,903 consecutive laparotomies was 0.64 per cent. Of the 50 patients, 49 had secondary closures. There seemed to be a seasonal variation as a greater proportion of the cases occurred during the winter and spring months, at a time when respiratory diseases are more prevalent. Multiple operations had been performed in 73.5 per cent of the cases. In 55 per cent the operation lasted one and a half hours or longer. Stay sutures of silk-worm gut, or silver wire were used in 36.5 per cent.

The clinical picture in the non-infected cases suggested an allergic reaction. The mortality following secondary closure was 3.4 per cent.

JOHN H. GARLOCK, M.D.

Iglauer, S.: Pulmonary Collapse Following Tonsillectomy under Local Anesthesia: Report of a Case. *Arch Otolaryngol*, 1937, 25 382

The author reports a case of pulmonary collapse following tonsillectomy under local anesthesia, and comments upon the great rarity of this condition. He states that the operation proceeded in a normal manner.

Morphine and atropine were administered prior to operation, and codeine and acetylsalicylic acid some hours later. The author believes that these drugs, together with the painful throat, may have inhibited the cough reflex and favored the inspiration of blood or saliva. However, no blood was found in the bronchi at bronchoscopy. After investigating all the factors connected with this case, he was unable to determine the cause of the atelectasis.

Finally, the author raises the question of a possible relationship between atelectasis and post-tonsillectomy pulmonary abscess.

JOHN H. GARLOCK, M.D.

Bracci, U.: The Frequency and Importance of Some Postoperative Humoral Variations (Su la frequenza e l'importanza di alcune variazioni umorali post-operatorie). *Pelidm*, Rome, 1937, 44 sez. chir. 181

In reviewing the literature Bracci found that during the last few years the biochemical and humoral study of the surgical patient in the post-operative state has gained considerable significance. Many theories have been advanced concerning the cause and pathogenesis of postoperative humoral variations, especially with reference to the variations in nitrogen and chloride metabolism.

The author studied personally a large number of individuals who had been operated upon and found that variations of the nitrogen metabolism are not observed constantly, but they occur in about 80 per cent of the cases. The urea values are more frequently altered than the values of the total nitrogen.

No parallelism exists between the variations of the urea nitrogen and the total nitrogen because of the almost constant relative increase of the urea fraction. The ratio of the urea nitrogen to the total nitrogen increases.

The degree of variation is usually not noteworthy, and hyperazotemia develops only in a few cases. In the majority of the cases the variations are within physiological limits. In general, it may be said that a rather well defined relationship exists between the degree and frequency of variation and the type of surgical intervention. There seems to exist also a relationship, between the kind of nitrogenous fraction and the type of operation; but it is difficult to demonstrate it. For instance, in surgical interventions on the urinary passages an increase of the urea fraction has often been found, whereas in operations involving the biliary system the pre-ureic fractions are found to be increased.

Probably the clinical symptoms observed in post-operative cases depend upon the passage of highly toxic substances into the circulation and the incomplete breakdown of the proteins plays the greatest rôle in this connection. In addition, there are all the other biochemical and humoral variations, of which the preceding are only a part.

The author is of the opinion that probably the cause and pathogenesis of postoperative hyperazotemia depend on not only one factor but a large number of factors, and variations occur according to the individual and the type of surgical intervention.

Anesthesia must finally also be considered. It plays unquestionably a very important rôle although its exact mechanism is not known.

According to the author the postoperative variations of the chlorides are probably not as important as was formerly believed, if they occur, they are only of secondary importance.

RICHARD E. SOMMA, M.D.

Oppolzer, R. von: Urgency Indications in the Postoperative Course (Dringliche Anzeigen im postoperativen Verlauf). *Wien med Wochenschr*, 1936, 2 1401

It is very important that the family physician, who superintends the postoperative treatment, should recognize those disturbances in the post-operative course which demand emergency intervention. The critical time is in the first few hours or days following the operation.

The most alarming complication in the post operative course is secondary hemorrhage. This danger is great in amputation of a limb when there is arteriosclerosis which may allow the ligatures to cut through the great vessels and in cases of phlegmons in the region of the great vascular trunks where there may be erosion hemorrhage brought on by the presence of drainage tubes in the vicinity of the vessels. The most painstaking control of the dressings is necessary they must never be covered but always accessible to the eye of the nurse. It is important that Esmarch bandages be kept near the patient ready for immediate use and it is advantageous to have the group to which the patient's blood belongs determined beforehand so that blood transfusion can be carried out promptly should need arise. Following goiter operations secondary hemorrhage may occur from the superior thyroid artery from failure of the ligature and the bleeding may proceed without an external sign the first indication being the formation of a hematoma in the cavity of the wound in the neck with consequent compression of the trachea. Postoperative secondary hemorrhages from whatever cause are favored by an abnormal readiness to bleed such as is found in long standing obstructive jaundice in such cases prophylactic treatment with calcium or cebion is indicated. Postoperative hemorrhages into the abdominal cavity are to be recognized by the signs of increasing anemia those into the stump of the stomach following gastric resection by hematemesis a second laparotomy is frequently necessary. Hematemesis occurs sometimes also from retrograde embolism after resections of the omentum.

A further condition which may cause fatal interruption of recovery from operations on the neck is suffocation. It is frequently produced by edema of the glottis for example after operations on the pharynx base of the tongue or on the neck particularly in infectious disease. In severe cases tracheotomy is required. The danger of suffocation may also arise in tracheomalacia it is combated by fixation of the goiter remnants to the sternocleidomastoid muscle. Progressive dyspnea can occur in acute tension pneumothorax after puncture injury to the thorax. In such cases puncture of the thorax may be urgently indicated.

Complications in the region of the abdominal cavity not infrequently confront the physician with a difficult situation. Among these complications may be mentioned acute dilatation of the stomach which in most cases occurs a few days after laparotomy and presents a typical clinical picture. Occasionally this complication may follow the application of a plaster-of-Paris jacket. It is combated by gastric lavage and the knee elbow position. Postoperative intestinal atony and paresis are caused by peritonitis in the majority of cases. In severe cases of this sort when other measures fail it may be necessary to establish an intestinal fistula. Postoperative colitis with soft diarrhetic stools may lead to severe collapse and death it occurs after

extensive resections of the stomach or small intestine. The best results are obtained from intravenous continuous drip infusion and blood transfusion. In postoperative peritonitis which develops either from operative infection or from the failure of stomach or intestinal sutures to hold peritonitis antiserum should be tried because not much can be expected from operative treatment. The circumscribed forms of postoperative peritonitis, Douglas's abscess or subphrenic abscess are more favorable. They must be opened *lege artis*. Stubborn postoperative singultus is a distressing complication which may last for days together and lead to a state of severe exhaustion. Postoperative mechanical obstruction of the intestine by kinks or adhesions requires immediate laparotomy. Postoperative urinary retention necessitates aseptic catheterization. If this is impossible perhaps because of high grade prostatic hypertrophy the establishment of a suprapubic vesical fistula must be considered.

If fever appears in the postoperative course, the first step should be to examine the operative wound and discover and remove abscesses or retentions if such are present. A menacing complication is the bursting open of the operative wound such as sometimes happens in cachectic patients or in patients with carcinoma. It requires secondary suture. In embolism of the pulmonary artery Dukes' eupavien therapy should be tried first. If it fails and consciousness is lost breathing stops and the pulse becomes hardly perceptible the Trendelenburg operation may be tried.

(MARTINIAN HIRSCH) FLORENCE A CARPENTER

ANESTHESIA

Flagg P J. Intratracheal Inhalation Anesthesia. A Review of Ten Years Experience with Special Reference to its Field of Usefulness. Details of Technique and Objections Raised Against the Method. *Arch Otolaryngol* 1937 25 405

Intratracheal inhalation anesthesia popularized by Meltzer and Auer more than twenty five years ago presents advantages which are as desirable to day as when they were introduced. The method fell into disfavor because of the technical difficulties presented by insufflation. The inhalation method developed by the author eliminates these difficulties and while preserving the advantages of the original method has added others. Notable among these is the ability to provide an aseptic field for operation in and about the mouth freedom from anesthetic vapor in the operative field facilities for resuscitation without motor driven apparatus accommodations for tracheal and bronchial suction during operation without the intrusion of a catheter into the operative field and an increase in the age range to include even the youngest infant.

While the apparatus employed is of the utmost simplicity and practically indestructible the light bulbs and Penrose tubes excepted the utmost care of this equipment is essential to its successful opera-

tion Details of this care and of the technique found satisfactory are reviewed

Laryngoscopy and intubation under complete relaxation constitute a simple procedure To provide a field permitting free intubation in every case is not simple The chief difficulty is to anesthetize the patient

A safe and satisfactory routine demands the use of ether as an anesthetic Some anesthetists have forgotten the use of this agent, and others have never learned how to use it

Intratracheal inhalation anesthesia is specifically indicated in operations on the brain, eye, nose, and nasal accessory sinuses, in oral surgery, infections of the airway, harelip and cleft palate, operations about the neck, cosmetic operations on the face, operations on the lungs, and in selected abdominal operations

Its use in tonsillectomy should be limited to those patients who have accustomed themselves to the presence of a tube in the mouth For such operations, it provides a fixed and quiet field

Objections to the method have been raised apparently because of misinformation regarding the background on which the instrumentation rests and the construction of the equipment, a misconception of the nature of the technique and lack of acquaintance with the field provided, the safety afforded and the relative absence of postoperative ill effects

An experience of ten years in the development and the use of intratracheal inhalation has confirmed the value of the procedure. It has also indicated the incidence of the difficulties to be met and the means of relief

As a mechanical convenience for reducing mortality and morbidity in operations about the head and neck, there is nothing that can compare with the protection offered by intratracheal anesthesia. Because of its practical value in this field and the increasing tendency of surgeons to accept tracheal manipulation as a matter of course, it will not be surprising to find the technique a routine procedure for general surgical intervention before many years have passed

JOHN H. GARLOCK, M.D.

Julia, A.: Anesthesia with Ethyl Bromide (Sur l'anesthésie au bromure d'éthyle) *Arch. et Anal.*, 1937, 3: 184

Ethyl bromide was used as an inhalation anesthetic as early as 1849, but was largely discontinued in 1914 and replaced by ethyl chloride, which was demonstrated to be superior to the ethyl bromide used at that time The difficulties experienced with ethyl bromide have since been shown to have been due, not to the gas itself, but to impurities associated with it It can now be obtained as a pure

gas, and careful pharmacodynamic studies on the dog have been reported by Nicloux, and Sumesnil. These indicate that pure ethyl bromide is a satisfactory anesthetic agent. The author reports a clinical experience with 30 patients anesthetized with pure ethyl bromide, using the preparation known as "bréthyl." In 20 patients ethyl bromide alone was used for from ten to forty-five minutes. Ten of these patients were old or had some physiological disturbance, diabetic or pulmonary, and 10 were healthy. Ten other cases are reported in which "bréthyl" was used for induction and the operation was completed under other anesthesia, or a mixture of anesthetics was used

The author concludes.

1. The results with ethyl bromide alone are satisfactory. The principal advantage is the remarkable rapidity with which the patient goes to sleep and awakens.

2. The same satisfactory results are obtained when ethyl bromide is combined with nitrous oxide, trichlorethanol, or the barbiturates.

3. It is advantageous to use an apparatus which accurately measures the amount and to induce anesthesia with high concentrations and then drop to low concentration

4. The chief disadvantage is that caused by the increase in the bronchial secretion.

Further study is in progress

M. M. ZINNINGER, M.D.

Jeanneney, G., and Planques, L. B.: A Contribution to the Study of the Action of General Anesthesia with Ether on the Liver (Contribution à l'étude de l'action de l'anesthésie générale à l'éther sur le foie) *Arch. et Anal.*, 1937, 3: 165

The authors first review the work already published on this subject, which is rather contradictory. This report is based on a study of the biliary function of the liver by means of the diazo reaction, and of the carbohydrate function by means of the galactose tolerance test in ten patients before and after operation under ether anesthesia. In all patients except one there was a rise in the bile pigment in the blood, beginning immediately after operation and reaching its maximum on the average during the second day, but falling below the pre-anesthetic level by the fifth day. In no case did the level exceed that of latent jaundice, the highest being 20 mgms of bilirubin. The galactose test revealed no significant changes

The authors conclude that with a normal or slightly impaired liver ether anesthesia of from fifteen to sixty minutes duration causes no significant changes.

M. M. ZINNINGER, M.D.

PHYSICO-CHEMICAL METHODS IN SURGERY

ROENTGENOLOGY

Bullio F. Roentgen Stereography of the Skull (La roentgen stereografia del cranio) *Radial med* 1937 24 109

Roentgen stereography makes it possible to give a spatial or plastic view of the skull and in this way to dissociate the shadows that are superimposed in the ordinary roentgenogram and make it difficult of interpretation. The technique of the method is discussed in detail. It obviates many of the difficulties of interpretation that are encountered in the ordinary roentgenogram particularly in the study of the petrous portion of the temporal bone, the mastoid cells, the cerebral fossae and the maxillary sinuses.

Recent methods of roentgen stereography give still better results than the older methods because of rotation of the skull or inclination of the tube which make the central ray strike at a different angle. The former method is to be preferred as it does not require any special apparatus either for the taking of the roentgenograms or their reading. It can be carried out quickly and permits of the use of the Potter-Bucky diaphragm. It requires a certain skill on the part of the roentgenologist in reading the roentgenograms which differ in some respects from ordinary ones. By the use of the oblique projection roentgen stereography acquires the greatest possible accuracy. As the various structures in the middle fossa are situated in different planes each one has a certain projection which brings it into the greatest relief and which is the best adapted for its study.

It is quite common at present in taking stereo roentgenograms particularly of the sella turcica to use small films and take only a very restricted zone but while the detail is greater in this way it is harder to get a good relief than with larger fields. The author is not partial to the use of these small formats he prefers a larger field with a view of the surrounding parts. There is no particular advantage in taking stereo roentgenograms with a long focal distance which is called telestereography.

If the clinical signs are not definite it is best to take an ordinary roentgenogram first and use stereo roentgenography only when it is necessary to supplement the findings in the roentgenogram.

The stereoscopic observation should be made in the orthoscopic or pseudoscopic projection. The pseudoscopic projection is indicated particularly if it reverses the images in Wheatstone's stereoscope.

ALBERT S. MORGAN M.D.

Brallford J. F. The Importance of Radiology in the Early Diagnosis of Bone Tumors *Brit J Radial* 1937 10 171

The methods of investigation available for the diagnosis of bone tumors other than radiological

are grouped under two headings: clinical and histological. The importance of a complete medical history and details of the development of the lesion is stressed. Usually pain, the size of the tumor or limitation of motion causes the patient to seek medical advice. Before the days of roentgen examination the discovery of a tumor causing pain and connected with a bone suggested the need of a biopsy study. This procedure is often filled with danger as it may cause dissemination of the tumor cells or may lead to an incorrect interpretation of the nature of the tumor. Brallford outlines the development of skeletal tissues and emphasizes the difficulty of differentiating malignant lesions from those of a traumatic or inflammatory nature by means of histological study.

Radiological investigation being the youngest method is often regarded with skepticism by the conservative. The importance of an adequate and if possible a definite interpretation of the roentgenogram is stressed. A correlation of all clinical roentgenological and histological findings is necessary and a positive finding by any one method should be regarded as the dominant factor. The difficulty in making an exact interpretation of roentgenological findings increases with the demand for earlier diagnoses. A study of the opposite limb for comparison and an examination of the lungs and other bones for metastases will be indicated in certain cases. All the refinements in technique available should be employed. The author feels that radiology should be considered first in all lesions of the bones.

The diagnosis of osteoclastoma and aneurysm of bone and their differential diagnosis are discussed by the author. Osteoclastoma formerly called myeloid sarcoma, myeloma and more recently simple giant cell tumor is characterized by a predominant proliferation of multinucleated giant cells. This tumor may involve any bone but the common sites are the juxta epiphyseal areas at the lower end of the femur, the radius and the tibia and the upper end of the tibia and the fibula. If the tumor is located in other bones such as the vertebrae, the pelvis or the bones of the hands and feet the findings are not as characteristic as when it is located in the more common sites. The tumor is rarely discovered in an early stage because it does not cause any signs or symptoms until later. Most patients have reached the age of from twenty to thirty years before the tumor is recognized. Usually the epiphyses have fused and the tumor has caused extensive destruction of the cancellous tissue in the area of the epiphyseal growth cartilage. The author disagrees with such authorities as Ewing, Geschickter and Copeland and believes that the tumor begins in the juxta epiphyseal area of the diaphysis rather than in the epiphysis. It is essentially a solvent of bone and there is no evidence of sclerosis. Although

the borders on the shaft side are not clearly defined, the bounds of the border of the tumor can usually be appreciated by the extent of the concavity in the bone due to the cancellous dissolution. The lesion may be confined to one side of the bone, but frequently the tumor destroys all of the cancellous tissue and fills the cortical shell. Expansion of the bone will then occur. The cancellous structure is often represented by only a few strands of bone. The lateral walls are gradually absorbed. The sub-articular bony boundary shows greater resistance and there may be a protective sclerosis. Periosteal irritation is not evident. The cortex is thinned by the tumor. The few remaining trabeculae may be completely absorbed, leaving an expanded cyst-like bony shell. Fracture of the diseased bone is not uncommon and deposits of calcium in the organized hemorrhage may occur. There may be a compression deformity with telescoping of the shaft into the bony shell. If the limb is immobilized, disuse osteoporosis will occur, which will have somewhat the same appearance as metastasis.

Chondroma, angioma, simple bone cyst, multilocular cysts, osteitis fibrosa cystica, metastasis, plasmocytoma, adamantinoma, chronic inflammatory processes, subperiosteal endothelioma, hemangio-endothelioma and sarcoma are lesions which must be given consideration in the differential diagnosis.

X-irradiation given over a long period will produce consolidation and alter the roentgen findings. This method of treatment has achieved marked success. Regeneration and consolidation of the damaged area is very slow. During the first one or two months the lesion appears to increase in size which should not cause alarm. The author advises resection as the best method of treatment as malignant metaplasia may occur after irradiation or curettage.

The author separates angiomas into three distinct types because of their characteristic roentgen appearance. In one type which most commonly involves one or more vertebrae and rarely other bones, the tumor invades and expands the bony structure without altering appreciably the surface contour. Angioma is the most common lesion found in the

vertebrae by the pathologist, and the frequency increases with age. The roentgen findings are characteristic. The involved body usually has a greater transverse diameter and less depth than the normal vertebra above or below. The bone is less dense, and there will be coarse but regular trabeculae which follow the direction of the normal bone striations. Collapse may occur as the result of slight trauma. The discs are spared. The fibrous type of Paget's disease must be considered in the differential diagnosis. On rare occasions the long bones may be the site of an angioma of this type.

The second type of angioma affecting the skull, ilium, scapula, clavicle, and the long bones has a different roentgen appearance. At the site of the tumor there will be seen an area of osteoporosis across which fine, bony trabeculae radiate from the center. These trabeculae become denser and coarser, and have a wavy appearance. Expansion of the bone occurs. The periphery of the tumor is well demarcated and the periosteal border regular. Resection of the involved bone and the use of bone grafts is recommended.

The long bones are also involved in the third type. The tumor occurs at the ends of the diaphysis and produces a soap-bubble-like expansion of the periphery of the bone with excavations into the underlying compact and cancellous tissue. The roentgen appearance suggests that these lesions may develop in a subperiosteal hematoma. Chondroma and osteoclastoma must be differentiated.

Hemangiomas associated with multiple chondromas show the changes typical of multiple chondromas of the bones of the hand, but in addition they show dense round opacities or phleboliths which indicate the existence of multiple hemangiomas in the soft tissues of the part. Hemangio-endothelioma show areas of cancellous destruction which slowly expand the bone and ultimately present a multilocular structure. In the later stages thick, irregular, bony septa bridge the walls of the expanded bone and prevent its collapse. Several bones may be involved. Osteitis fibrosa cystica localisata must be considered in the differential diagnosis.

EARL C. BARTH, M.D.

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Tuohy E B and Essex H F. *A Comparative Study of the Physiological Activity of Cofebrin and Epinephrine*. *Surgery* 1937 1: 564

In this comparative study of cofebrin and epinephrine it has been shown that these two substances have many properties in common and that for the most part their physiological behavior is identical. There are, however, several differences which are noteworthy. Both substances produce similar increases in the blood pressure of test animals, with the exception that the activity of cofebrin generally lasts slightly longer than that of epinephrine. The duration of the pressor response produced by comparable doses of cofebrin is midway between that of epinephrine and ephedrine. Epinephrine causes a more marked but shorter pressor response than ephedrine. Cofebrin gives the same abrupt pressor response as epinephrine; the pressor response of cofebrin lasts longer than that of epinephrine but does not last as long as that of ephedrine.

The presence or absence of vagal reflexes during the studies of the effects of epinephrine and cofebrin on the blood pressure were not constant in occurrence under any type of anesthesia. As a rule neither substance gave evidence of a reflex vagal slowing with a concomitant decrease in the blood pressure. The advantage which a few clinical investigators have claimed for cofebrin is that it does not produce reflex vagal slowing of the heart. This finding was substantiated. The results which were obtained with commercial epinephrine were comparable with those obtained with cofebrin. Consequently the use of cofebrin in stead of epinephrine would appear to have no advantage in this respect. One outstanding and important difference between these closely allied compounds is that cofebrin is active when administered by mouth while epinephrine is not. Herein lies the one major difference in the action of these two substances.

Cofebrin was found to be just as effective as epinephrine in stimulating the perfused isolated heart of the rabbit and the ability of cofebrin to cause relaxation of a rhythmically contracting uterus of a virgin guinea pig or to relieve bronchospasm was identical with that of epinephrine. To determine the site of destruction of cofebrin in the body, the Starling heart lung heart lung liver and heart lung hind limb perfusion preparations were employed. It was found that practically none of the cofebrin was inactivated in the heart lung perfusion experiments which fact coincides directly with the results of Elliott's experiments with epinephrine. However, the heart lung liver and the heart lung hind limb perfusion experiments indicated definitely that any large capillary bed with the exception of

that of the lungs, serves as a site for the elimination of cofebrin. The liver is by no means as specific an organ for the inactivation of cofebrin as it is for the inactivation of nicotine or novocain. Studies on the blood sugar of dogs showed that epinephrine and cofebrin were equally potent in producing decrease in the values for the blood sugar provided the animals were in a proper state of nutrition.

Robinson L J. *Neurological Complications Following the Administration of Vaccines and Serums. Report of a Case of Peripheral Paralysis Following the Injection of Typhoid Vaccine*. *New England J Med* 1937 216: 831

A case of flaccid peripheral paralysis following the administration of typhoid paratyphoid A and B vaccine is presented. A careful elimination of other possible causes of the paralysis was made. It was noted four days after the second injection of the vaccine. At that time there occurred a left foot drop followed later by an atrophy and a reaction of degeneration. Physiotherapy was administered and after three and a half months recovery was practically complete.

A review of similar neurological complications following serums and vaccines is presented and their clinical pictures are described. The differential diagnosis demands distinction from peripheral paralyses caused by anterior poliomyelitis and poisoning, diabetes, alcoholism and avitaminosis.

The etiological mechanisms that have been invoked in the past include perineural edema resulting from a local manifestation of a general serum reaction, a specific neurotoxin and an attenuated virus disease.

Physiotherapy is advocated as the treatment of such peripheral neurological complications occurring following the administration of serums or vaccines.

SAMUEL KARY M.D.

Watson A J. *Fat Embolism. Report of a Case with a Review of the Literature*. *Brit J Surg* 1937 24: 676

In the case reported a post mortem diagnosis of acute cerebral fat embolism following a compound fracture of the tibia was made. After the injury a greater degree of shock was present than could be accounted for by the fracture itself. The wound was excised, the clot removed and the fracture reduced under gas oxygen and a considerable quantity of ether. After twelve hours there was a little rusty sputum; after twenty-four hours there was precordial pain, slight fever, tachycardia and rapid respiration; after thirty-six hours coma and after sixty hours deep coma. Cheyne-Stokes respiration and many small petechial hemorrhages over the neck, arms and upper part of the trunk. Death occurred after about eighty hours.

A review of the literature leads to the following conclusions

Fat emboli are demonstrable in small numbers in about 14 per cent of all autopsies. After injury, and particularly after fractures, extensive fat embolism may be found in the lungs and in the brain, in a small proportion of the cases inflammatory changes are produced which may prove fatal. The exact mechanism of absorption is not known. The fat globules producing the embolism probably come from the site of injury, but it is possible that normal blood fat is a source of the emboli. The symptoms and signs of fat embolism fall into two main groups, pulmonary and systemic. The diagnosis is made largely on clinical progress and by exclusion of other complications of injury. The presence of fat in the urine and in the sputum, and the appearance of petechial, hemorrhagic rash are important additional signs. Treatment is unsatisfactory as no successful method of dislodging or breaking up the fatty globules in the capillaries has been found. For prevention, all writers stress the avoidance of unnecessary handling or rough manipulation of the fractures in first aid as well as in subsequent treatment. Immobilization after operation on bones and fractures seems important. The replacement, if possible, of ether by other forms of anesthesia seems desirable when there is gross injury to the bones or fatty tissue.

WALTER H. NADLER, M.D.

Jelke, H.: A Case of Idiopathic Tetany Treated with A.T. 10, with a Review of the Tetanies, with Special Consideration of the Pathogenesis and Therapy (Ein mit A.T. 10 behandelter Fall von idiopathischer Tetanie, samt einer Uebersicht ueber die Tetanien mit besonderer Hinsicht auf Pathogenese und Therapie) *Acta med Scand*, 1937, Supp. 8r.

After a short review of the symptomatology of tetany, the author presents a classification of this disease based upon its pathogenesis. The endogenic and exogenic factors are considered. Among the cases caused by endogenic factors are those in which parathyroid insufficiency is the most important etiological factor, and those in which an insufficiency of vitamin D is effective through the parathyroid. The second main group is attributable to the different kinds of alkalosis of the blood plasma. Group I includes infantile tetany, or spasmophilia, postoperative tetany of parathyroidectomy, parathyroiditis due to general infections or to thyroiditis, idiopathic tetany, tetany of maternity, tetany of osteomalacia, and epidemic tetany. Group II includes true gastric tetany as found in pyloric stenosis and high intestinal obstructions, tetany in sprue and similar diseases, hyperventilation tetany, and tetanies due to excessive administration of bicarbonate, phosphate, sodium citrate, and fluorin poisoning.

The importance of sharp differentiation between the true so-called gastric tetany and the gastrointestinal symptoms associated with idiopathic tetany is stressed.

The cause of chronic, idiopathic tetany in adults is hypoparathyroidism, which is due to some hypothetical injury of the parathyroids and leads to marked hypocalcemia occasionally as low as 5 mg per 100 c.c. Pathological investigations on this subject are not available, but localized tumors, or tuberculosis of the parathyroids, and inflammatory changes due to lymphadenitis have occasionally been reported in these glands.

Possibly the idiopathic tetany of adults is not as rare as the few cases reported in the literature suggest, probably a number of cases have been overlooked under the diagnosis of muscular rheumatism and neurosis. In some of the cases gastro-intestinal symptoms, such as attacks of abdominal pains, vomiting, and possibly diarrheas, with actual ileus predominate, other cases show more chronic gastro-intestinal symptoms. The pathogenesis is an increased irritability, especially of the sympathetic nervous system, with resulting painful spastic conditions. Attention is called to the studies of Collozo, Resa, and Cruz on the rôle of the so-called carotid gland in tetany of parathyroidectomy, and also to West's investigations on the neuromuscular irritability in parathyroidectomized dogs.

After reviewing the treatment with Vitamin D, various calcium preparations, acidosis-producing preparations, parathyroid, and thyroid preparations, the author claims that in postoperative and idiopathic tetanies the administration of A.T. 10, antitetanic remedy No. 10, has proved superior to all treatments with the possible exception of transplantation of the parathyroid tissue. Over 300 cases of tetany, mostly postoperative tetany, have been treated with A.T. 10 without one failure. After a few weeks the patients were asymptomatic and able to work. This remedy introduces a new epoch in the history of tetany therapy.

In minute detail the author reports a case of idiopathic tetany in a woman aged fifty who suffered from attacks of painful tonic cramps for twenty-two years, occasionally she had spasms of the glottis, twice with general cramps and unconsciousness. She also had bilateral cataracts and secondary anemia.

The problem of "epilepsy in tetany" is also discussed in relation to this case, and the author concludes that the so-called genuine epilepsy is essentially different from tetany-epilepsy, which resembles more the eclamptic attacks occurring in infantile tetany.

In this case the A.T. 10 therapy produced a rapid recovery. A substitution of vitamin D and calcium therapy for A.T. 10 resulted in failure, whereupon A.T. 10 was used again. With a dosage of 2 c.c. every tenth day the patient became practically asymptomatic. As this remedy is perfectly reliable, constant in effect, and harmless, with certain precautions it may well be recommended for idiopathic tetany in spite of its pharmacodynamic effect, which theoretically varies from the effect of ideal substitution therapy.

LOUIS NEUWELT, M.D.

Weller C V Intrinsic Factors in the Etiology of Neoplasms 1st J Cancer 1937 30 19

Since cell division and tissue growth are intrinsic attributes of every metazoan organism every organism possesses the basic intrinsic factors essential for neoplastic growth.

Neoplasms like all other disease processes result from the combined action of intrinsic and extrinsic factors. If the extrinsic factor is sufficiently potent it is conceivable that neoplasia may be induced in any organism.

In addition to this universal intrinsic attribute the actual occurrence, the type and the site of neoplasms are determined in part by specific intrinsic factors but in varying degrees and in different ways for different new growths.

There is no gene for cancer as a whole or for non-cancer. The significance of intrinsic factors, the part played by genes and by extrachromosomal factors and the mendelian implications if any must be worked out separately for each kind of neoplasm.

In certain instances neoplasia develops upon morphological or functional abnormalities which are themselves intrinsic and inheritable. Some of these are dominant and some recessive in the mendelian sense and the resulting neoplasms tend to approximate the hereditary pattern of the lesions upon which they develop. SAMUEL KAJAN M D

Longrope W T and Pierson J W Boeck's Sarcoid (Sarcoidosis) Bull Johns Hopkins Hosp Balt 1937 60 223

Boeck's sarcoid or sarcoidosis is an affection which in the past has been referred to quite separately as a disease of the skin, as an affection of the bones and as a disease of the lymph node. It is only within comparatively recent years that the clinical manifestations have been recognized as different expressions of a single pathological process, the etiology of which still remains undetermined. The disease is now usually described as one that presents the clinical features of a chronic infectious granuloma persisting often for years, sometimes spreading slowly from one organ or tissue of the body to another, frequently relapsing, seldom producing serious constitutional symptoms, resisting treatment but at times healing spontaneously. It usually starts in early adult life, more than half of the 200 cases collected by Koss never began before the thirtieth year of the patient. The progress is insidious until the disease produces obvious changes, most often in the skin or in the lymph nodes, in the bones of the hands and feet or in the lungs. Since the disease is most familiar to the dermatologist, the vast majority of cases have been reported as eruptions of the skin usually affecting the face, ears, nose and extremities. Involvement of other organs and tissues takes place regularly in association with the cutaneous lesions. The lymph nodes are very frequently enlarged, sometimes to a considerable degree. The enlargement may be localized or generalized. There is no regional relationship to the

lesions of the skin. Kissmeyer emphasizes the frequency with which the bronchial lymph nodes, the lungs and the bones are affected.

Enlarged peribronchial lymph nodes and increased hilar shadows are common. In addition there may be fine reticulation of the lung, usually in the lower lobe. The hilar shadows also extend characteristically toward the base rather than the apex. The clinical features attending the pulmonary lesions vary considerably but often there are no physical signs or symptoms even in the presence of extensive involvement. Radiographic shadows may gradually recede and disappear entirely, or they may persist relatively unaltered for months or years. The condition is often referred to in the literature as a tuberculoid or a benign form of disseminated tuberculosis.

The mucous membrane of the nose, the nasopharynx, the larynx and the conjunctiva may be involved. Not infrequently the tongue is affected. The spleen and liver may enlarge.

The changes in the bones are remarkable. The hands and feet are usually affected and in rare instances the long bones are involved. Usually the fingers are irregularly enlarged, the tip is squared with some dorsal flexion of the last phalanx. Frequently the fingers are deformed by subcutaneous nodules placed about the interphalangeal joints. The roentgenogram is characteristic. It discloses areas of rarefaction and reticulation of the medulla of the phalanges but without involvement of the joints or periosteum. The areas of rarefaction usually occur as sharply defined, round punched-out pits.

Changes in the eye occur also. For this reason it is frequently referred to as one of the manifestations of the disease. Cases with involvement of the conjunctiva and with iridocyclitis have been reported. The lacrimal and parotid glands are also involved at times. In addition it seems probable that practically any organ or tissue in the body may be affected and at autopsy the lesions have been found disseminated throughout the body in much the same manner as miliary tuberculosis.

The pathological lesions are essentially the same regardless of their sites. They appear as collections of large pale staining epithelioid cells arranged in the form of miliary tubercles, sometimes lying as isolated structures in a comparatively normal tissue and sometimes occurring in groups or strands. The collection of cells may attain such large proportions as to replace most of the normal tissue. They are not as a rule outlined by an inflammatory zone of lymphoid cells and a characteristic feature is the absence of inflammatory reaction in the surrounding tissue. The absence of caseation has attracted the attention of almost everyone who has written on the subject. The appearance of the pathological lesion has led almost inevitably to the belief that the disease is tuberculous but this contention has never been proved.

The disease rarely occurs in tuberculous families. The tuberculin reaction is frequently negative.

Acid-fast bacilli rarely, if ever, can be found in the lesions of the skin or lymph nodes. Experimental animal inoculations have failed to demonstrate that the disease is caused by the tubercle bacillus. In spite of these facts, the view prevails that it is a peculiar form of benign tuberculosis.

Although the disease pursues a chronic and often benign course, spontaneous healing may occur. In many cases it lasts for years, and may recur apparently after cure has taken place.

It is highly refractory to treatment, arsenic in various forms has been employed by most observers. Finsen ray, ultra-violet light, x-rays and radium also have been employed. Recently, beneficial effects have been reported from the use of preparations of chaulmoogra oil.

The authors report in detail eight cases studied at the Johns Hopkins Hospital since 1923. An extensive bibliography is appended to the article.

ARTHUR S. W. TOUROFF, M. D.

Weidman, F. D.: Xanthosarcoma of the Cheek Succeeding Xanthosarcoma of the Forearm: Multiple Tumors Versus Metastasis. *Arch Surg*, 1937, 34, 792.

With xanthomatous tumor-like masses occurring (1) in granulation tissue, (2) in diabetic and pseudo-diabetic conditions, (3) with adenocarcinoma of the stomach, (4) with adenocarcinoma of the duodenal papilla, (5) with strictures of the bile ducts, (6) with acute pancreatitis, and (7) with hydatid cysts, the attention of the surgeon must be drawn to the disturbed general lipid metabolism, which occurs in most of the lesions just mentioned.

In short, it is no longer sufficient to view the yellow tumor of tendons and subcutaneous parts simply in a prognostic light, it is incumbent on the physician to distinguish between the yellow color due to blood

pigment and that due to lipid. Lipoid coloration is part of a true xanthomatous change. In the case of the latter, a broad field of internal medicine opens up, which invites the cognizance of the surgeon as well as of the pathologist, internist, pediatrician, laryngologist, and ophthalmologist.

A fatal case of xanthosarcoma is reported which was almost unique on account of nodules in the oral mucosa and deep tissues of the cheek. While there were some factors which pointed to metastasis from the lesion of the forearm, it was more likely that the two foci developed independently as the result of separate trauma or as "tumors of multiple origin." Whether metastatic or pluricentric, multiple xanthosarcomas must be given a guarded prognosis. Multiple tumors may acquire a practical prognostic significance comparable to that of metastatic tumors.

Reports of cases of xanthomatous tumors collected from the literature are listed. The growths in these cases include fibroma, neurofibroma, myxolipoma, angioma, endothelioma and sarcoma. Even carcinomas may be xanthomatous.

In general, there are numerous analogies between fibrosarcoma and xanthosarcoma, their relation to trauma, their origin in tendon sheaths and other fibrous structures, and their slow growth and local malignancy. Distant metastasis of xanthosarcomas appears to be unknown, contrary to recent reports in the literature.

Extensive yellow coloration of sarcomas, particularly of the extremities, may be due (1) to necrosis or pigmentation, or (2) to xanthomatous change.

While xanthomatous processes observed in sarcomas probably have no bearing on the prognosis and treatment, their significance in relation to the lipid metabolism in its widest aspect, including cholesterol and its esters, should not be forgotten.

JOSEPH K. NARAT, M. D.

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NOTE—THE BOLD FACE FIGURES IN BRACKETS AT THE RIGHT OF A REFERENCE INDICATE THE PAGE OF THE ISSUE ON WHICH AN ABSTRACT OF THE ARTICLE REFERRED TO MAY BE FOUND

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INTERNATIONAL ABSTRACT OF SURGERY

OCTOBER, 1937

COLLECTIVE REVIEW

MALIGNANCY OF THE FEMALE GENITALIA

A Review of the Literature for 1936

DANIEL G. MORTON, M D, San Francisco, California

PART II

Ovarian Tumors
Carcinoma of the Fallopian Tube
Carcinoma of the Vulva and Vagina
Rare Malignant Tumors
Endometriosis

OVARIAN TUMORS

THE reviews by Bernstein (17), Lynch (183), Murphy (209), Ries and Bueno (233), and Szathmáry (261) are the source of much interesting information regarding the incidence, pathology, symptoms, and curability of malignant ovarian tumors. Szathmáry's 222 cases constituted 9 per cent of all genital carcinomas, and about 20 per cent of all ovarian tumors at the II Budapest Women's Clinic. Malignancy was present in 17.3 per cent of Bernstein's 1,101 ovarian tumors, about one-half of which were of the proliferating variety. Lynch's 110 cases constituted 36 per cent of 302 ovarian neoplasms, while Ries and Bueno found malignancy in only 17.1 per cent of 146 ovarian neoplasms. The most common form of malignant ovarian tumor was the papillary serous cystadenocarcinoma. Eighty per cent of Bernstein's cases, and 86 per cent of Lynch's cases were of this type. Malignant pseudomucinous tumors were next in order of frequency. A small percentage of the cases proved to be Krukenberg tumors, solid carcinomas, and squamous carcinomas in dermoids, sarcomas, and embryonal tumors. Szathmáry divides his cases a little

differently, but in all probability this is of academic significance only. This author reports cystic carcinomas in 59.3 per cent, solid tumors in 33.3 per cent, and part-cystic, part-solid tumors in 7.4 per cent. Malignant tumors are very likely to be bilateral; this was true in 59 per cent of Lynch's cases, 55 per cent of Bernstein's, 45 per cent of Szathmáry's, and 72.5 per cent of Murphy's. If only the papillary growths were considered, the percentages would be much higher. Therefore, the most usual ovarian carcinoma is typically bilateral. The largest percentage of women presenting malignant ovarian tumors are in the menopausal age. Two-thirds of Lynch's patients were between forty and sixty years of age; and the average age of Szathmáry's patients was 45 years. However, if ovarian tumors, including simple follicle and luteal cysts, are considered in general, the average age of the patients in whom they are found is much younger. Bernstein considers the age incidence in another way: 58 per cent of the 139 women who were in the menopause had malignant tumors. Nine hundred and sixty-three of his patients had not reached the menopause. The possible relationships of marriage and pregnancy remain obscure. About one-third of Szathmáry's patients were nulliparous. Bernstein states that both benign and malignant ovarian tumors are about twice as common in nulliparous women as they are in the parous. Lynch found that one-third of the married women in his series had never become pregnant, and that among those who had been pregnant, abortions were unusually frequent. These facts suggested that women

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dependent mainly upon the type of lining cell. This work is purely an anatomical one and without clinical significance.

Giant ovarian tumors are rare, particularly in this day and age. Hamlin (126) reports a case in which a semi-cystic tumor of 70 lbs was found. The tumor was decompressed gradually and finally removed, with a good recovery. These tumors are rarely malignant. Hamlin quotes Ward's article written in 1922 in which Ward reported a cystic tumor weighing 221 lbs, and collected 5 tumors from the literature weighing more than 225 lbs.

Hurdon (147) reports 3 cases of uterine tumors secondary to cystic ovarian tumors. Two of these followed pseudomucinous cysts and 1 followed a papillary cystadenocarcinoma. (For further data on the coexistence of ovarian and uterine carcinomas see the section on carcinoma of the uterine fundus.) Kirshbaum (156) describes a case in which a large metastatic ovarian carcinoma developed secondary to a carcinoma of the vocal cords.

Of some interest is the occurrence of carcinoma in a dermoid cyst. While not reported frequently, Kent (154) believes that more careful pathological examination would reveal it much more frequently. This author studied 49 dermoid tumors and found 4 with malignant changes. There is nothing characteristic in the history of these cases. Szathmáry (262) calls attention to the fact that a roentgenogram of the lower abdomen may be of value in the diagnosis of teratomas. This author reports 167 (16.6 per cent) such tumors among 1,005 proliferating ovarian tumors, of which 6 showed areas of malignant degeneration. Only 1 tumor was a true teratoma composed entirely of embryonic tissue. Complications such as rupture, necrosis, and infection were noted. Ascites was observed rarely. Twist of the pedicle was fairly common. DeQueiroz (64) reports a dermoid cyst with carcinomatous transformation.

Malignant ovarian tumors in children are rare. There are 3 cases reported in the 1936 literature. Atakam's (8) case was that of a girl of twelve years in whom was found a voluminous sarcoma of the right ovary. Marked ascites and loss of weight were noted, but there was no precocious sexual development. Bjorkenheim (19) reports a malignant ovarian tumor in a child of six years associated with uterine bleeding, endometrial hyperplasia, and increase in the size of the breasts. Microscopically the tumor appeared to consist of embryonal mesenchyme. This neoplasm may have represented the sar-

comatoid type of granulosa-cell tumor. The third case is reported by de Sa (65). The growth occurred in a girl of twelve years, and was a carcinoma.

Two cases of ovarian sarcoma are reported by Schockaert (248) in connection with pregnancy. One occurred in a woman seven months pregnant, the other in a puerperal woman. While such tumors are rare in pregnancy, their occasional occurrence causes the author to believe that all pregnant women should be examined carefully *per vaginam*, and that if an ovarian tumor is found it should be removed at once. Hixson (144) describes a myxofibrosarcoma of the ovary, which occurred in a twenty-nine-year-old woman who complained of amenorrhea and a tumor mass extending upward from the lower abdomen to the umbilicus.

A number of reports deal with the Krukenberg tumor. Cases are reported by Celentano (38), Conill (44), Delannoy, Driessens and Demarez (62), Fennel (88), Fernández-Ruiz (89), Harms (128), and Zienkiewicz (286). Harms's case is remarkable because the diagnosis was made on cervical biopsy. The significant finding was a positive mucin reaction, although no definite signet-ring forms were present. In several of the cases a carcinoma of the gastro-intestinal tract was demonstrated also, and in several no such lesion was found. Celentano reviews the literature rather thoroughly and comes to the conclusion that these tumors are always secondary to a growth in the gastro-intestinal tract. Fennel and Delannoy, Driessens and Demarez also subscribe to this belief. Celentano quotes Gauthier-Villars who collected 355 cases from the literature and noted a gastro-intestinal lesion in 288. The stomach was by all odds the most frequent site. The method of spread is unknown; it may be direct, or through the blood stream. Fennel brings out that a small cancer of the stomach may exist for a long time without symptoms and metastasize to the ovaries to form Krukenberg tumors, the discovery of which leads to its diagnosis. Therefore, the presence of such tumors should always lead to a careful investigation of the gastro-intestinal tract. These tumors are likely to be bilateral, and the normal shape of the ovaries is often preserved. Ascites may be present. The principal microscopic characteristic is the coexistence of glands and signet-ring cells. Delannoy, Driessens and Demarez raise the question of what to do if at laparotomy for the ovarian tumors a gastric origin is suspected and confirmed. If the patient is in good condition they advise gastrectomy, otherwise gastro-enterostomy. If

developing malignant ovarian tumors may do so because of some functional genital abnormality.

The symptoms are varied, they may be absent, or consist of a vague sense of pressure, or the presence of a mass, pain, dyspnea, cachexia, and the like. Particular attention is called to the frequent association of menstrual irregularities. While no special form of irregularity is characteristic, variations from the normal are not uncommon. The special ovarian tumors with well defined hormonal activities, such as granulosa cell tumors and arrhenoblastomata are excluded as they are to be commented upon separately. Both Chavauaz and Roche (42), and Moulouquet and Leveuf (206) report a case in which uterine bleeding, presumably due to ovarian tumor, occurred long after the menopause. The case of the former proved to be a fibrosarcoma; that of the latter, a cystadenoma. These authors believe that postmenopausal uterine bleeding should suggest the possibility of an ovarian tumor. Pughlatti (229) states that one half of the cases of malignant ovarian tumors are associated with menstrual disturbances and bleeding is observed in one third of the patients who have reached the menopause. While the bleeding is occasionally due to metastasis in the endometrium or comes through the tube directly from the tumor it is usually due to hyperplasia of the endometrium. Sometimes hypomenorrhea or amenorrhea is found. This author investigated the content of precollagenous fibers in the endometrium under these various circumstances. Precollagenous fibers were increased in number in cases exhibiting hypomenorrhea or amenorrhea, and decreased in cases of menorrhagia and metrorrhagia.

Ascites is a fairly common finding. Free fluid was found in 54 per cent of the cases operated upon in Szathmáry's series. When present, ascites is very suggestive of the type of tumor present. In 91 per cent of the cases with ascites in Bernstein's series the growth was a papillary cystadenocarcinoma.

Lynch (183) brings out that the possibility of error in the diagnosis of ovarian tumors is considerable. In his series 15 per cent of the 302 neoplasms were incorrectly diagnosed. When a mass is discovered there may be confusion as to whether it is ovarian or otherwise. Even if definitely ovarian it may be impossible to tell whether malignancy is present or not. Jeanneney and Rousseau (150) report two cases of solid ovarian tumors misdiagnosed as uterine fibroids which illustrate how confusing the signs and symptoms can be. Coexistent tumors may be confused also. Because of these difficulties, laparotomy

should almost always be performed when a pelvic genital tumor is present (unless there is some special contra indication), lest a malignancy be overlooked.

The treatment recommended is surgery and roentgen therapy. All observers note a large percentage of inoperable growths, but in general removal is recommended when possible even if metastases are present. Many operations are necessarily incomplete, or amount merely to an exploratory laparotomy. Sometimes difficulty is due to the advanced state of the growth, sometimes to a variety of complications. Fekete (36) reports complications such as twist of the pedicle, necrosis, intraligamentous location, rupture of the cyst, and suppuration in 14.5 per cent of the cases operated upon for malignant ovarian tumors. Lynch obtained a 35.5 per cent five year salvage, but only 11.8 per cent of the cases were absolutely free of recurrence. Szathmáry reports a 31.6 per cent absolute five year cure, and 45.5 per cent relative cure in operable cases. Only 18.7 per cent of the patients with bilateral tumors remained well for five years while 60.8 per cent of the patients with unilateral growths were cured. This author found also that he cured as many cases of unilateral tumor by simple removal, as by a more radical operation in which both ovaries and tubes and the uterus were removed. Therefore he recommends the simpler operation in childless or young women with unilateral cysts. He modifies the operation if the tumor is of a particularly malignant type.

Roentgen therapy shortly after operation is recommended by all. Lynch doubts its efficacy in effecting cure, although he believes that it may prolong life. Szathmáry on the other hand attributes his good results to the prophylactic value of roentgen therapy. Probably ovarian tumors vary in sensitivity to radiation, but both Lynch and Murphy believe that histological grading is of little value in determining this sensitivity.

Lynch's careful analysis in which he found that 14 of his 22 cures occurred in cases showing small cancerous areas only in otherwise benign cystadenomas, leads him to a very gloomy conclusion regarding the prognosis in cases of ovarian carcinoma. This is a striking demonstration which should make all of us very careful not to delude ourselves by a mere figure representative of a five year cure. It is also brought out by this author that many patients who survive five years, have recurrences later.

Leroux, Leuret and Weinroth (174) divide malignant ovarian tumors into five basic types

entiate them from the sarcomatoid variety of the granulosa-cell tumors, to which they are very closely related indeed. According to Meyer their origin is similar to that of the latter, both types of tumors coming from undifferentiated germinal epithelium, the one differentiating toward the female side to form the granulosa-cell tumor, the other differentiating toward the male side to form the arrhenoblastoma. According to Schiller's (242) description of the arrhenoblastoma, in the earliest stage it looks like a cellular fibroma, in the next phase trabeculae corresponding to the embryonic cords but without spermatogonia appear. These trabeculae are thin and consist of only two cell layers, the cells are high columnar with their axes parallel to the axis of the cell column. As maturity is approached, a lumen develops between the two cell layers. Fat-laden cells similar to the Leydig cells of the testicle form in the connective tissue between the large cell columns. The highest stage in development is the canalicular form, the testicular adenoma of Pick described above. The latter is similar to and often found in the rete of the testis. Like the rete, it exerts no hormonal action. The most distinctive feature of the arrhenoblastoma is its masculinizing effect. However, as Schiller emphasizes when judging the biological effect, one must be careful to distinguish between defeminization and masculinization. For instance, atrophy of the breasts and amenorrhea are not typical symptoms of masculinization, but may be due to other causes. The most characteristic signs of masculinization are marked growth of hair on the face and body, deepening of the voice, and hypertrophy of the clitoris. Additional symptoms listed by Schockaert (247) are amenorrhea and sterility, assumption of the masculine body form, coarsening of the skin (often acne), atrophy of the uterus and the healthy ovary, and diminution of the libido or even a tendency toward homosexuality. These symptoms disappear after the removal of the tumor. Schockaert describes an arrhenoblastoma in a woman of twenty-six years. The tumor gave rise to typical masculinization. On removal, it was yellow in color and small in size. These findings are characteristic of these tumors. Six months later, most of the signs of masculinization had disappeared. Plate (223) reports 3 cases in women thirty-seven, forty-nine, and sixty years old respectively. Evidence of masculinization was present in all. Ahumada and Calatroni (2) report a case four and one-half years after removal of the tumor. At this time, complete feminization of the individual had become re-established. These authors emphasize

the benignity of these growths. Baldwin and Gafford (11) describe a typical case in a negress of twenty-four years. Gnassi (111) reports a case in a woman of forty-three years, remarkable because multiple small tumors were present. Removal of the tumors resulted in the restoration of a feminine habitus.

Schiller advances the theory that as cases of histologically characteristic arrhenoblastomata without masculinizing effect have been observed, it must be assumed that the masculinizing effect becomes evident only when anlagen of masculinization are present. Such anlagen are not present in all women. Masculinization occurs only through the coincidence of these anlagen with an arrhenoblastoma. Schiller believes that anlagen are present also when masculinizing adrenal tumors are found. This author further examines critically the cases of masculinization reported in association with lutein tumors and granulosa-cell tumors. He does not believe that the association is authentic. He believes that in the former case the tumors were probably adrenal, not luteal; and in the latter, that the symptoms of true masculinization were lacking.

A third member of this group of ovarian tumors is the *disgerminoma*, or seminoma. Meyer believes this tumor is derived from absolutely undifferentiated germinal epithelium. Giant cells and epithelial cylindrical structures reminiscent of the seminiferous tubules may be found. Because of the lack of differentiation of these cells, no hormone is produced. None of the reported cases exhibited hormonal effects. Klaus (157) reports 5 cases. He believes that the disgerminoma grows slowly, but is of low malignancy. He states that these tumors are susceptible to radiation. Doederlein's (71) case in a girl of nineteen years illustrates that the disgerminoma is a dangerous tumor. The original growth was the size of a fetal head at term at the time of removal. After a short time, recurrence took place in the other ovary. This was removed. Death followed shortly after from generalized recurrence. One of Fauvet's (85) three patients died of recurrence; the patient in the case reported by Masciottra and Etcheverry (187) died also. The latter patient survived four years before there were any signs of the recurrence. Gentil (108) reports 6 cases of ovarian seminoma, all of which were malignant. Kleijn (158) reports a case in a girl of sixteen years, and reviews the literature. Pre-operative diagnosis is usually impossible. Fauvet states that they are very elastic on palpation. The evident malignancy of these tumors indicates radical operation.

at operation for gastric cancer the ovaries are found to be involved they advise oophorectomy.

Within recent years a great deal of attention has been directed toward certain special ovarian tumors the component cells of which are specifically of the sex cell type such as the granulosa-cell tumor arrhenoblastoma dysgerminoma, and Brenner-cell tumor. Some of these tumors are remarkable for their decided hormonal effects. Not all of them are malignant. During 1936 numerous articles were published concerning these tumors many of them are case reports only. Novak and Gray (215) give a useful clinical review of the characteristics of these various tumors, based upon a study of 43 granulosa cell tumors, 5 arrhenoblastomas, 11 dysgerminomas and 6 Brenner cell tumors.

The granulosa cell tumor may occur at any age but is most common during menstrual life. It is not a common tumor. Siovall (254) found 4 (0.9 per cent) among 429 ovarian tumors at the Pathologic Institute in Lund. The tumor is often small, but it may reach very considerable proportions. The pathological anatomy is described in detail by Moulouguet and Varangot (207) in an article illustrated by beautiful colored plates. Microscopically the growths are made up of cells which resemble granulosa cells. Sometimes the cells appear to be luteinized. Quite frequently there are small bodies which resemble an early developing ovum. There may also be small bodies resembling diminutive corpora albicantia. A number of different forms may be assumed, the folliculoid, the cythroid, the trabecular and the sarcomatoid. The stroma is not particularly distinctive but often takes on a sarcomatoid appearance. The various forms may occur side by side in the same tumor. Usually these tumors are benign in appearance and are well encapsulated. According to Moulouguet and Varangot about 5 per cent are malignant and when the tumors are malignant the malignancy is high grade. According to Meyer these tumors originate from cell rests (germinal ridge) which differentiate toward the female side. Like true granulosa cells, they produce quantities of female sex hormone or estrin. An increased amount of this substance has been demonstrated in the blood of patients with such tumors which has decreased after removal of the tumors. Meyer, Thornton and Neumann have produced estrus in animals with extracts of granulosa cell tumors. Gospe (116) reports a bio-assay of a granulosa-cell tumor in which he found 3.2 mouse units of estrogenic material per gram of fresh tumor tissue, or 36 mouse units per gram of

desiccated tissue. The production of large amounts of estrin is responsible for the menstrual symptoms which are observed in these cases. In the very young precocious sexual development results. During the period of genital activity there may be either menorrhagia or amenorrhea. After the menopause uterine and endometrial hyperplasia develop and give rise to bleeding which is often periodic. This bleeding is characteristic, and often leads to the diagnosis of granulosa cell tumors even in the absence of a palpable tumor. Hermann (136) reports a case and discusses the radiosensitivity of these growths. In his case there was marked endometrial hyperplasia and menorrhagia. Two castration doses of x rays were given without effect. Hermann found 4 cases in the literature in which the failure of an x ray castration dose necessitated operation. Several other cases were found reported in which a cancer dose had been given, with definite cure in 3. He concludes that the radiosensitivity of granulosa cell tumors is largely a matter of proper dosage, and recommends a dosage of from 800 to 1,000 r. Moulouguet and Varangot state that while these tumors are quite sensitive to radiation regression of the growth is brief. Fisanovic (94) reports 2 cases in children seven and ten years of age respectively. Both children died of recurrence after operative removal. Barzilai (13) Feletar (87), Petrusburgskij (221) and Kelley and Goss (153) each report a case. Wolfe and Kaminister (287) report 2 cases. Szathmari (263) reports a case of interest because 360 mouse units of hormone were demonstrated in the urine postoperatively. Holman (145) describes a case in which there were bilateral tumors. In all, according to Moulouguet and Varangot (207), about 120 cases had been reported up to the time of the publication of their article.

At the opposite end of the scale of tumors developed from sex cells are the arrhenoblastomas. These tumors are similar in structure to the fetal testicle, and may resemble any stage of its development so that some are made up of undifferentiated cells some how primitive cords and some exhibit well developed tubules. Often these tumors produce the male sex hormone. The effect of this hormone is particularly distinctive transforming the secondary sexual characteristics of the individual from femaleness to maleness. When highly differentiated these tumors look like testicular adenomas, the adenoma ovarii testicularis described by Pick in 1903. When poorly developed their appearance may be sarcomatoid, and it is very difficult to differ

tion. He removes the groin glands only when they are suspicious. Taussig calls attention to the fact, however, that many of the women are old and cannot expect to live five years under any circumstances, while others present a condition too advanced for operative treatment. He was unable to operate upon 25 per cent of his cases. He has now performed 43 complete operations with 2 deaths (4.6 per cent). Of the 23 patients operated upon over five years ago, 15 are well (65 per cent). Blair-Bell and Datnow report 10 of 22 patients alive and well from five to twenty years. Mouen (205) observes that cancer of the clitoris occurs as a part of vulval cancer in 16 per cent of the cases. With proper operation a 11.7 per cent five-year cure has been obtained. He reports a case treated by vulvectomy, the patient died of recurrence in one year. Schreiner and Wehr (249) report 148 cases of vulval and clitoridean cancer treated by local fulguration and irradiation of the regional glands. Five-year cures were obtained in 42 per cent of the cases in which the lesion was local and in 18 per cent of all the cases. Koeveslegethy (159) reports 59 cases of vulval cancer of which the 47 inoperable ones were treated by 1,000 to 2,000 mgh. of heavily filtered radium. Five-year cures were obtained in 13.1 per cent of this group. Carranza (36) describes his results in 120 cases. He attempts to suit his operation to the type of case, and believes that some type of operation, even simple removal, should be done in all but the most advanced cases. Hansen (127) advises radical operation in one sitting when the clitoris is involved, because of early spread to the regional glands.

Esmann (80) in reporting a case states that melanosis of the vulva has been reported in the world literature only 82 times, according to Kehrer in the Veit-Stoeckel Handbook of Gynecology. The average length of life after diagnosis is eighteen months, only a few of the patients remaining alive after three or four years.

Urethral tumors are rare. Carcinoma of the urethra was encountered 16 times in 3,105 malignancies of the female genitalia by Schreiner and Wehr (249). Watson (277) reports 17 cases seen over a twelve-year period. Den Hoed (63) reports that 16 urethral cancers were noted at the Cancer Institute in Amsterdam between 1915 and 1932. Desai (67) reports 2 cases. The usual symptoms are bleeding and difficulty in urinating. The prognosis is extremely poor no matter what the form of treatment. Watson advises coagulation, surgical removal, and post-operative radiation. Of his 17 patients, 7 exhib-

ited groin metastasis. Three of the 17 died within six months, 1 within two years, and 1 after seven years and four months. Two were lost from observation. Eight remain under observation, 2 of whom are alive more than five years after treatment. Desai favors local radiation followed by resection of the inguinal glands. Den Hoed states that radiation was always employed at Amsterdam. Their five-year salvage was 31 per cent. Lazarus and Schneider (169) describe an operative method: (first step) formation of a suprapubic fistula and insertion of a catheter, (second step) burning out of the urethra and adjacent bladder; (third step) radiation; (fourth step) removal of the inguinal glands; (fifth step) radiation of this area. A patient upon whom this operation was performed regained continence after a reconstructive operation. Hidalgo and Fernandez-Cano (138) reported a nut-sized tumor on the posterior urethral wall which turned out to be an angioma with an epithelial covering. This tumor was removed by electrocoagulation. The authors state that such tumors may recur.

Carcinoma of the vagina occurs in from 0.19 to 3 per cent of genital malignancies, according to various authors. Filho (90) reports 2 cases in women thirty-six and forty-eight years old, respectively, and takes occasion to review the salient facts concerning this disease. According to this author, vaginal cancer occurs most frequently in women between twenty-one and forty-years of age (in 40 per cent of the cases). There is no definite cause, but trauma and inflammation may play an important rôle. Veit refers to 6 cases observed after the use of a pessary. However, the disease may occur in nulliparous women. Leucoplakia has been emphasized as an important precursor by many authors. Vaginal cancer may assume 2 forms: one in which a diffuse granular growth covers the vaginal mucosa more or less completely, and the other in which there is a localized elevated or ulcerated growth. The latter is likely to erode into whatever viscus is adjacent and, thus, frequently lead to vesicovaginal and rectovaginal fistulae. Histologically, the growths are squamous-celled except for the few rare adenocarcinomas arising from Gaertner's-duct remnants. The posterior vaginal wall is the most frequent site. Regional metastases may occur quite early. Distant metastases are rare. The glands involved depend upon the site of the original lesion. Tumors in the lower portion of the vagina metastasize to the inguinal glands, while those in the upper vagina spread to the iliac and lumbar glands. Symptoms are bloody or serosanguinous foul dis-

The fourth and last member of this special group of ovarian tumors is the *Brenner cell tumor*. This tumor has also been reported under the names, oophoroma folliculare adenofibroma, cysticum papillare ovarii, and folliculoma. Four cases are reported by Fauvet (84), 4 by Games (104), 1 by Delannoy and Bedrine (60), 1 by Proeschner and Rosasco (227), and 1 by Smith (256). Games found 72 cases reported in the literature up to the time of his article, which with his 4 cases made a total of 76. Among the cases reported in 1936, the age of the patients varied between forty one and sixty two years. According to Games review 60 per cent of the tumors occur after the menopause. All of the authors agree that these tumors produce no hormonal effect and are not malignant. They are usually unilateral. Fauvet, Games, Novak and Proeschner and Rosasco subscribe to Meyer's theory that these tumors originate from the undifferentiated cell bodies of Walthard. While Walthard bodies may be found on structures other than the ovary e.g. the tube, Fauvet believes that these tumors are characteristically ovarian and could not originate from serosal nests. The microscopic picture is quite characteristic. Epithelial strands and masses are found lying in a dense fibrous stroma. Cystic spaces are often formed by central necrosis of the epithelial masses. The cells resemble squamous cells they may be oval or polygonal. The cell membrane is well marked and the cytoplasm is very pale. These cells contain a colloid material which gives the tumors the appearance of pseudomucinous tumors, to which they are genetically related. Proeschner and Rosasco quote Meyer's work in which he divides Brenner tumors into two groups (A) the solid form with typical Brenner epithelium and (B) the cystaderoma form with small or medium sized nodules containing typical Brenner epithelium with and without areas of pseudomucinous epithelium.

CARCINOMA OF THE FALLOPIAN TUBE

A total of 75 new cases of tubal carcinoma are reported 2 by Charache (40) 1 each by Held (132), Loogwinskij (180) Bloomheld (21), Gaillard (103), Dannreuther (58) Randall (230) and Leuret (176) 10 by Schmidt (244) 3 by Lantnik (268) and 3 by Robinson (234). The last author was able to collect 48 cases from the literature published since the collection of 301 by Nurnberger, from 1932 to the beginning of 1935, making a total of 349 cases reported to that date. It is pointed out that this condition constitutes less than 0.5 per cent of all genital

tumors. Cases have been reported in individuals from eighteen to seventy three years of age. The greatest age incidence lies between the ages of forty and fifty years. There is no new information regarding its cause. Both Charache and Gaillard believe that chronic inflammation predisposes to the condition. A variety of symptoms are described pain, watery discharge, bloody discharge, and temporary disappearance of pain after a gush of fluid. The signs are those of a salpingitis or an adnexal tumor of any origin. Diagnosis before operation is practically impossible. Indeed many cases have been incorrectly regarded as inflammatory in origin even at operation, and the correct diagnosis was revealed only in the laboratory. For this reason it is advised by Schmidt that in the presence of large inflamed adnexal tumors in the climacteric age radical removal of the genitalia should be performed. Frequently both tubes are involved. The growth is usually papillary or papillo adenoid. Tuberculous adenosalpingitis may sometimes produce pictures which simulate carcinoma otherwise there is no difficulty in making a pathological diagnosis.

However, all of the authors report that the prognosis is gloomy. Only rarely have the patients survived beyond three years after operation. The treatment is radical removal of the genitalia. Subsequent radiation is recommended by some.

CARCINOMA OF THE VULVA AND VAGINA

Carcinoma of the vulva is a comparatively rare form of genital malignancy, occurring in from 1 to 4 per cent of cases according to Blair Bell and Datnow (20). Ninety per cent of the vulval malignancies occur as squamous carcinoma. They usually occur after the menopause and are not related to previous child bearing. The clitoris and labia are the most frequent sites. With Taussig (265) and others these authors believe that leucoplakia is a potent predisposing condition and go so far as to say that if all cases of leucoplakia could be treated effectively the incidence of vulval carcinoma would be cut in half. The growth may be papillary or ulcerative. Symptoms are pruritus swelling, appearance of a lump and a foul bloody discharge. The inguinal and femoral glands may become involved after a short time. Distant metastases are rare. Taussig (265) Blair Bell and Datnow (20), and Kuestner (164) advocate radical vulvectomy with removal of the regional the inguinal and femoral glands. Den Hoed (63) removes the local growth with a diathermy needle and employs subsequent radia-

siveness The incidence is greatest in patients between forty and fifty years of age. There is no special relation to the marital state, parity, or the menopause These tumors almost always occur in the body of the uterus, and are more common in submucous than in either intramural or subserous growths While the fibroids are usually multiple, malignant changes are generally present in one fibroid only

In the cases reported in which the result was noted, there was a fairly high percentage of early recurrence and death The prognosis must always be guarded. Bobbio (22) warns that all growing fibroids after the menopause should be viewed with suspicion He advises roentgen irradiation after operative removal Delannoy and Driessens (61) bring up the important consideration of the danger of treating fibroids by irradiation If irradiation is used routinely, those cases in which sarcoma is present may easily be overlooked until it is too late Indeed, this is a possibility in any case of fibroids treated by roentgen irradiation Daniel (54) raises the question: Does sarcoma develop more often in irradiated fibroids? A number of reports in the literature led him to believe that this is the case He therefore believes that surgery is the best treatment for fibroids Unfortunately the majority of the cases in which cures have resulted have been those in which sarcoma was discovered postoperatively, well confined to a fibroid mass. When there are symptoms and signs present suggestive of sarcoma, generally speaking, the case is not curable

Other forms of uterine sarcoma receive scant mention in the past year's literature Visser (273) reports a botryoid sarcoma in a woman of sixty-four years, which filled the vagina at the time of diagnosis The patient refused treatment and died in eight months This form of uterine sarcoma is more common in younger women, and is sometimes seen in children It is more common in the cervix than the endometrium.

Of considerable interest is the association of sarcoma and carcinoma in the same tumor. In his report on 4 rare malignant tumors of the uterus, Wilkening (279) describes a carcinosarcomatous polyp in a woman of sixty-eight years Daniel and Lăzărescu (56) report a similar tumor occurring in a short-pediced polypoid mass in the uterine wall Histologically, there was an adenocarcinoma, which in some areas was definitely squamous in character; in the center of the mass, the stroma presented the characteristics of a spindle-cell sarcoma In 1928, Albrecht gathered from the literature a total of 51 tumors of this

type occurring in various locations Daniel and Lăzărescu were able to find 16 cases with involvement of the uterus in the literature. Virchow has warned against the error of designating tumors in which a carcinoma assumes a sarcoma-form as sarcomatous, or vice versa.

Sarcoma of the Cervix. Cases of sarcoma of the cervix are reported by Kraemer (161), Luker (182), Scollo (252), and Binet and Devain (18) Kraemer's 2 cases occurred in women thirty-four and thirty-six years old, respectively. One woman presented a large polyp; the other a diffuse growth of the cervix with metastases. The latter died within five months after radium treatment. The former was apparently cured by panhysterectomy Luker's case occurred in a woman of 37 years, the tumor was also polypoid in form The case of Binet and Devain was that of a woman of 34 years, whose vagina was filled with a fist-sized tumor coming from the cervix. This differed from the common botryoid form. Complete operative removal failed to cure the patient, and she died within six weeks Scollo's patient was a woman of 71 years, who had been treated with radium four years before for a presumed epithelioma of the cervix No biopsy was made A stenosis of the upper vagina occurred, back of which fluid accumulated to form a cystic uterine tumor. Upon removal a sarcoma was found. The question of the rôle of radiation stenosis in the production of this tumor is raised. The possibility that the original growth for which radium was given might have been a sarcoma was not discussed. All authors agree that the prognosis in cases of sarcoma of the cervix is always bad

Other Pelvic Sarcomas An extremely rare case of a primary sarcoma of the round ligament is described by Constantinesco and Albu (45) in a woman of 29 years An equally rare case of lymphosarcoma of the parametrium in a woman of 27 years is described by Tobilewitsch (268). This tumor had attained the size of a fist, and was the cause of vaginal bleeding The fact that this patient was still alive and well eight years after removal of the tumor was remarkable.

In his description of retroperitoneal pelvic tumors, Miller (201) mentions the occasional occurrence of various types of sarcoma in this location These tumors are discussed from the angle of the confusion that they may cause in diagnosis Usually these cases are hopeless

A curious malignant tumor, which they call a *genital blastoma*, is described by Le Lorier and Isidor (172). This tumor presents a varied appearance, the morphological aspects observable in the course of organogenesis may be reproduced,

charge, pelvic pain, and bladder or rectal symptoms, depending upon the location of the growth. From a diagnostic point of view, ulcerated lesions must be differentiated from those of syphilis and tuberculosis. Ideas of the proper treatment vary. The prognosis is always bad. Filho (90) favors operation when the growth is well confined, and radiation in advanced cases. Weibel's figures for 1925 are quoted of 25 cases of cancer of the upper vagina in which radical removal was carried out from above, 5 (20 per cent) terminated fatally, and 8 (32 per cent) were cured for over five years. Franz operated upon 7 of 18 cases, and cured 1 for six years. Cornich and Philips reported 53 cases radiated in Bum's clinic of 10 which were operable 3 were cured and of 40 which were inoperable 7 (13.7 per cent) were cured. Franque reported 1 five year cure in 7 cases which were radiated. Westmann had five year cures in 12 per cent of his cases. Carranza (35) prefers radiation except in the rare case in which the lesion is small circumscribed, and accessible.

Carosini (34) considers the subject in detail. The facts he brings out are in accord with those related previously. He favors surgical treatment. Wide excision through paravaginal incisions is recommended when the cancer is confined to the posterior vaginal wall. Cases of this type almost never remain free of recurrence. When the growth involves the anterior wall and cervix, radical abdominal removal of the genitalia is performed. When the cancer involves the rectum, this organ must be removed also. Such mutilating operations with so little prospect of cure do not seem very attractive to the reviewer. Hield (133, 134) prefers radiation and employs a modification of the Regaud method. Roentgen therapy is combined with the radium. Of 8 patients so treated, 5 are still alive 2 for more than five years 1 for three years, and 2 for less than a year.

RARE MALIGNANT TUMORS

Sarcoma of the Uterus. Sarcoma may arise in the wall of the uterus in a fibromyoma, or in the endometrium. Its incidence is not large when compared with that of carcinoma. It occurs in 1 or 2 per cent of all uterine tumors according to Delannoy and Driessens (61) and Teittinen (266). During 1936 1 case was reported by Potter (226), 1 by Villard, Callot and Contamin (272), 5 by Bobbio (22), 5 by Care (33), 2 by Teittinen (266), 4 by Delannoy and Driessens (61), 1 by Visser (273), and 1 by Ahumada. Prestini, and Ahumada (3), a few additional cases in which sarcoma and carcinoma were associated were also reported and

will be commented upon separately. Most interest centers around the occurrence of sarcoma in fibromyomas as this condition can rarely be diagnosed and therefore constitutes a serious clinical problem. The incidence of sarcoma occurring in fibroids is given as from 0 to 10 per cent. Care gives it as 0.22 per cent, Teittinen in a review of ten articles as 3 per cent. Potter in a review of the literature as from 0.6 to 1 per cent. Daniel (54) as 1.2 per cent, and McFarland (103) in a review of 27 articles as from 0 to 10 per cent. McFarland asks the question: Why does the reported incidence vary so widely? He observes incontrovertibly that the incidence must necessarily depend to some extent upon the thoroughness with which malignant areas are sought. He believes that there is considerable variation in the criteria of malignancy, and that many cases are reported in which the diagnosis is incorrectly based upon microscopic evidence only, without clinical correlation or follow up. In this author's opinion these tumors do not arise from a change in the muscle cells, a 'malignant degeneration', but originate from cell rests, that is these tumors are malignant from their inception and are not merely fibroids which have become malignant. Criteria of malignancy are enumerated in detail. Since these changes have been found in tumors which have not recurred, McFarland wonders if perhaps recurrence and metastasis are not the only proper criteria of malignancy. Others have argued that these tumors originate in the muscle and not in the connective tissue. According to Care (33), the muscle cell origin has the most adherents. He found 126 cases reported in considerable detail. In 48 the origin was stated as muscle in 12 connective tissue in 1 both and in 63 no statement was made. Of 96 cases, the cell type was spindle in 31 round in 5 both in 4 mixed in 22, and smooth muscle in 8. Care's review also calls attention to the following salient points:

The diagnosis is usually not made preoperatively the signs and symptoms being those of uterine fibroids. Suggestive of the condition are rapid growth of the tumor the reappearance of symptoms after the menopause, and the occurrence of foul discharge. The mass is often soft or cystic. Grossly, the appearance may suggest brain or fish. Often hemorrhagic areas are present. The following microscopic findings are characteristic: enlarged cells varying in size shape and staining reaction; irregularity in the arrangement of cells; hyperchromatic nuclei, giant cells; decrease in stromal fibrous tissue; thinness of vessel walls; numerous mitotic figures, and inva-

only embryonic fibers in which the cross striation is not well developed. The presence of large cells resembling embryonic myeloblasts is suggestive of these fibers. One of the most characteristic heterotopic elements is hyaline cartilage. It is immature in type, present only in very small areas. It was noted in 28 of 45 corporeal tumors and in 20 of 31 cervical. Osteoid tissue is of rare occurrence. Fat has been reported in a few cases. Nerve tissue has been described in 2 cases. Smooth muscle has been observed, but this tissue is not heterotopic. Extreme vascularity is a common feature, therefore hemorrhages into the substance are frequent. A remarkable feature is the completeness of the epithelial covering. Tumors of the body are covered with columnar epithelium, those of the cervix with squamous or transitional epithelium. Probably the stroma and epithelium are stimulated to growth by a common factor. In support of this idea is the fact that carcinomatous change has been noted in the epithelial covering in a number of cases. Glands which closely resemble the normal glands of endometrium or cervix have been found frequently and probably represent inclusions. The line of demarcation between the tumor and uterine wall is usually sharp. When local invasion occurs, it is commonly the spindle-shaped cells which are the invaders. The malignancy of a particular tumor bears no relation to the amount of local invasion.

Metastases The pelvis is the most common site of the secondary deposits. The deposits often form enormous masses, and are usually diffuse and amorphous. Common sites are in the parametria, broad ligaments, vagina, and peritoneal cavity. The ovary and pelvic lymph nodes are rarely invaded. The lungs and pleurae are the most common sites for remote metastases. Metastases are diffuse and amorphous, usually they do not reproduce all of the heterologous elements. The picture is commonly one of spindle-cell sarcoma, myxosarcoma, or both.

Histogenesis. Meikle believes that the heterotopic elements are derived from an undifferentiated embryonic tissue which then undergoes differentiation, rather than that they are derived from tissues present in the uterus which have undergone hyperplasia. The various hypotheses regarding the origin of these tumors are reviewed. The author believes that the tumors arise from cell rests of primitive mesodermal tissue which have been deposited along the line of backward growth of the Wolffian ducts. Some of these cells may migrate within the substance of the uterus, thus accounting for the position of those found

away from the line of Gaertner's ducts. The stimulus to neoplasm formation, whatever it may be, acts first on the uterine epithelium, and usually results in a formation of carcinoma alone. Occasionally, however, this neoplastic stimulus is conveyed to a uterus containing embryonic mesodermal cells. Both the epithelium and the embryonic mesoblastic tissue are stimulated to growth. The latter grows so fast that the epithelium has no time to develop invasive properties, but grows enough to cover the tumor. Occasionally the epithelium becomes malignant also. When compared with mixed tumors in other locations, the incidence of malignant change in the epithelium of the uterine tumors is much lower.

Symptomatology In general the symptoms are similar to those of carcinoma in the cervix or fundus. Bleeding, foul discharge, and the passage of bits of necrotic tissue are the usual symptoms. Urinary frequency, and the presence of a tumor are fairly common.

Diagnosis A diagnosis based on clinical grounds is often difficult. Cervical tumors must be distinguished from polypi, hydatid mole, and cancer. Mixed tumors of the body are even more difficult to diagnose, as they are easily confused with carcinomas, sarcomas, and fibroids. Microscopic examination is usually necessary. Even this is not infallible, since a single section may suggest sarcoma or miss the growth entirely.

Treatment The results of treatment have been uniformly bad, only one patient having survived for five years following operation. On theoretical grounds, the author prefers radical hysterectomy with removal of the upper half of the vagina and the regional lymph nodes, followed by deep x-ray therapy.

Gucci (122) describes a case of a mixed tumor of the right broad ligament in a woman of forty-seven years. Microscopically this tumor appeared to be benign. Unfortunately the patient died of pneumonia.

Probably the connective-tissue mixed tumor of the tube described by Scheideler (240) should also be placed in this category. The tumor was both submucous and intramuscular, contained cartilage, fat, muscle, and angiomatous areas. Scheideler designates it a chondro-angiolipofibroma.

Perithelioma A tumor of this type occurring in the cervix is described by Celentano (39). Perithelioma is defined as a tumor arising from the investing cells of vessels. In other words, it is a specialized type of endothelioma. Except in the early stages, the appearance is not very char-

as if under some hormonal stimulus a dedifferentiation had taken place, leading to a reproduction of the embryonic form. In the case described the uterus contained a cauliflower growth. The right tube was enlarged toward the peripheral end and was similar in appearance to a pyosalpinx. Section revealed a thin walled cavity filled with a whitish tumor mass. The right ovary was slightly enlarged and cystic. The left tube was smaller than the right, but contained a similar granular tumor. The left ovary was normal. Microscopic examination of the tubes revealed a papillary growth similar to the vegetative ovarian tumors. In the muscle layers of the uterus were elongated cystic spaces lined by endothelial like cells, suggesting the epioophoron. Vegetations were also present in the muscle layers. The stromal cells in some areas showed all transitions between the usual adult forms and the epithelial cells of the vegetative growth. Many of these cells looked like syncytial cells. Papillary proliferations were also present on the peritoneum. The uterine tumor presented a varied picture close to its attachment to the myometrium, it looked like the usual adenocarcinoma of the corpus farther out in the lumen it appeared as a more papillary structure like that in the tubes. The stromal cells varied from typical fibroblasts to epithelioid cells indistinguishable from those of the tumor proper. In the myometrium beneath the serosa were a number of cystic spaces and deep indentations of the serosa suggestive of endometriosis. The stroma in this location was also of ambiguous character. The lining of the uterus elsewhere than at the tumor site resembled Wolffian epithelium. Vegetative growths with ambiguous stroma were present also on the surface of the right ovary and on the extragenital peritoneum. The authors believe that such blastomatous growths are embryonic in origin. They interpret the undifferentiated elements as cells which have retained or reacquired the evolutive potential of the cells of the celomic sexual eminence. This same case is described and discussed by Le Lorrer, Isidor and Maricot (173) in a different journal. Isidor (148) reports 2 other cases: 1 uterine and 1 ovarian which he believes were of the blastomatous type. Areas typically sarcomatous others typically epithelial were present as well as variations between the two. He states that several such tumors have been described. Some believe them to be separate coincident tumors others believe them to be carcinomas presenting a sarcomatoid appearance in some areas, still others explain them as due to dedifferentiation.

Mesodermal Mixed Tumors Tumors of this type are rare in the uterus. An excellent report by Meikle (198), in which he reports a case and reviews the literature, includes a detailed description of these growths. He states that the mixed tissues in these tumors are essentially heterotopic to the uterus and that the growths possess a high degree of malignancy. The average age of the patients with corporeal tumors was 53 years and with cervical tumors 31. The corpus is the more common site, in the ratio of 145 to 1. The tumors usually arise from a fairly narrow pedicle, those of the corpus may have a more diffuse origin. The macroscopic appearance varies considerably, more particularly between those of corporeal and those of cervical origin. The cervical growths often assume a botryoid form, they are aborescent and composed of grape like vesicles. They may grow as large as a fetal head at term. Superficial areas of necrosis are common. On section white, yellow, red and brown areas are seen. Cystic cavities containing blood and pus are often present. In this connection Yourkevitch and Khmelevsky (283) state that what are ordinarily called racemose arcomas of the cervix and vagina are usually mesodermal mixed tumors. The corporeal tumors are usually polypoid, sometimes single sometimes multiple. They are commonly submucous. The botryoid form is rare in the body. Corporeal tumors may attain a larger size than the cervical, they are firmer lobulated or papillary and often contain cartilage visible to the naked eye. Microscopically the tumors are composed of a large number of heterologous elements the number and relative proportions varying with each tumor. A most characteristic tissue is a loose connective tissue myxomatous in appearance. Most observers regard this as embryonic mesenchyme from which the other tissues are derived. Others consider this tissue true myxoma. Constituent cells are star shaped or triangular with long protoplasmic strands running from the points and meeting those of other cells thus producing a loose network. Cell nuclei are round or oval, usually single. The intercellular substance is clear or slightly granular. Groups of small round cells resembling lymphocytes have been observed. These may represent the most primitive cells present. Spindle cells similar to the constituent cells of a pure spindle cell sarcoma are often present. Giant cells have been observed in many cases. Striated muscle has been found in many mixed tumors, in 14 of 25 cervical tumors and in 20 of 42 corporeal tumors. Striated fibers are often difficult to find, probably because many are

from the literature. Cotte (47) adds 1 case of diffuse endometriosis of the uterus to the 10 which he and Trillat reported in 1933. The patient was thirty-seven years old, and had never been pregnant. She complained of a great deal of pain on the second and third days of menstruation, a symptom which was common to the entire previous group of 10. The symptoms were relieved only by supravaginal hysterectomy. On microscopic examination many well developed islands of endometrium-like tissue were found.

Skorpi (255) discusses endometriosis of the vagina, vulva, and labia in an exhaustive manner. The common clinical symptoms of swelling of the tumors, intratumoral bleeding and pain at menstruation, are described. Such lesions are designated as heterotopic, as opposed to internal or orthotopic lesions. Heterotopic growths may also be intra-abdominal. In the world literature this author was able to find only 5 cases of endometriosis of the vagina and 9 of the labia. Endometriosis of the vagina may be implanted either primarily or secondarily. In the former case the lesion always occurs in the midline. This fits in with the dysontogenetic theory of Meyer, who found a specialized epithelium in the midline similar to that of the muellerian ducts, and attributes endometrium-like growths in this location to a development of these undifferentiated anlage from hormonal influence, trauma, or the like. This type of growth differs from the implanted growth found in the labia, such a growth always follows trauma. The latter variety supports Sampson's theory. Also in support of this theory are the cases of endometriosis which develop in the abdominal wound after cesarean section or supra-vaginal hysterectomy. Inconsistent with the theory are the cases in which endometriosis develops in the abdominal wound after operations not entailing the opening of the uterus, such as appendectomy. The author is of the opinion that the implantation theory is correct for the cases of endometriosis occurring in the rare locations described, but for all other cases the condition is best explained by Heim's dysontogenetic theory which states that endometriosis develops from embryonal rests of meso-endothelium and mesenchyme.

Gonzales-Mármol (114) discusses the anatomy of the condition and five theories of origin. The theories are (1) the embryonal, (2) the theory of Cullen, that there is a penetrating growth from the endometrial cavity, (3) the metaplasia theory of Ivanoff and Meyer, (4) the implantation theory of Sampson, and (5) the metastatic propagation theory of Halban.

The possibility of carcinoma developing in endometriotic areas is an interesting one. Hauser (130) reports a case, and states that he was able to find only two others reported, one by Cullen and one by de Snoo. Hauser's patient was a thirty-two-year-old woman whose periods had been profuse since their inception. Many therapeutic measures were tried to control the excessive bleeding to no avail. Finally hysterectomy was decided upon. The uterus contained a tumor in its posterior wall. This tumor was honeycombed with areas of endometriosis, many of which presented definite malignant characteristics.

On the basis of his experiments, Zaleski (285) reports on the influence of mechanical and chemical factors in stimulating the growth of endometriotic implants in young female rabbits. Small bits of endometrium were taken from the uterine horns, ground up, and implanted in various locations, such as under the skin of the ear, under the vaginal mucosa, on the surface of the intestines, and in the liver. When these locations were re-examined from fifty to three hundred days later, small cystic, nodular growths were found in about half of the cases. In a series of 30 cases, iodine was injected into implanted foci. On re-examination definite epithelial deposits were found in 18. This author believes that mechanical and chemical stimuli favor the development of adenomyosis.

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acteristic, and may resemble sarcoma or carcinoma. Indeed, a number of authors deny that there is a specific tumor which may be called a perithelioma and call such tumors sarcomas, while still another group calls them carcinomas. The author believes that there is such a tumor, the characteristics of which are as follows:

1 The tumor originates from the investing cells of the vessels. The association with blood vessels is the most characteristic feature, and when not found, because of propagation away from the vessels and then degeneration, may preclude a proper diagnosis.

2 Its component cells may be cubical or cylindrical and contain large nuclei in a granular cytoplasm. Each cell is likely to differ from its neighbor.

3 The stroma is an abundant connective tissue containing but few vessels. The stroma and parenchyma are intimately associated much more so than in the case of carcinoma. Silver staining demonstrates the presence of collagen and precollagen in relatively large quantities.

Celentano says that very few cases of perithelioma of the cervix have been reported. He believes that this is true because many cases are confused with inflammatory lesions of the cervix, sarcoma and carcinoma. In the case reported the growth presented as a small vegetation on the right side of the cervix and bled easily on manipulation.

Miscellaneous. Rust (237) reports a case of Gaertner's duct adenoma of the cervix in a woman of 47 years. The complaint was bleeding. A small red area the size of a linseed on the posterior cervical lip could be seen. This failed to stain with iodine. Biopsy revealed the true nature of the condition. The author thinks that removal is advisable as a prophylactic measure lest malignancy occur. Kotz (160) reports 3 cases in which small cysts of the cervix presented in women thirty and thirty-two years of age. The lining was composed of cubical cells. According to the author, these were Gaertner's duct cysts.

Rockstroh (236) describes a plum sized multilobular, cystic tumor blocking the introitus and springing from the anterior vaginal wall. This proved to be lined by an epithelium which was thought to represent the fetal structure of Gaertner's duct.

Jaernecke (140) reports a case of adenocarcinoma of Bartholin's gland in a girl nineteen years old. He states that only 40 such cases have been reported in the world literature.

Ahumada and Schlossberg (4) report a sweat gland adenoma of the vulva in a woman of 41

years. The microscopic characteristics are described. The authors were unable to decide whether it was truly malignant or not.

ENDOMETRIOSIS

The literature on endometriosis appearing during the year 1936 deals principally with the presence of endometrium like tissue in a variety of locations, the problems of diagnosis arising therefrom, symptoms, signs and a discussion of the theories of origin. McLean (194) reports 6 cases of endometriosis of the large bowel, 3 of the rectovaginal septum, 2 of the rectosigmoid junction and 1 presenting a mass in the lower sigmoid as well as a second endometrioma in the upper rectum. He differentiates this condition from carcinoma of the large bowel. Its occurrence is rare when compared with that of carcinoma. 6 cases of endometriosis to 200 cases of carcinoma during the same twenty year period. The symptoms are intensified during the menstrual period. Vague abdominal pain, cramps, and constipation are apt to be present. If the lesion is in the lower rectum there may be pain on defecation. Occasionally there is bleeding. Actual obstruction is rare. On examination there is a palpable mass. Proctoscopic examination reveals very little bulging of the mucosa. Roentgenographic examination after a barium enema is of little value. If the condition is visualized at laparotomy it resembles a scirrhous carcinoma, but there are three important differences: (1) it does not tend to encircle the bowel, (2) the tumor can be lifted up as a discrete 'button', and (3) no lymph glands are involved. If the patient is at or near the menopausal age, radiation of the ovaries is the treatment of choice. Occasionally local removal with oophorectomy is indicated. McLean favors Sampson's theory of origin. He calls attention to the fact that sites of predilection are those where the peritoneum is folded irregularly, e.g. at the umbilicus, the cul de sac, and the internal inguinal ring.

Three cases of endometriosis of the umbilicus are reported by Strongin (259) occurring in women aged thirty-three, forty, and forty-three years, respectively. One of these cases followed laparotomy. He states that a total of 63 cases of endometriosis in this location had been reported up to the end of 1935.

Weis and Fobe (278) report a case of endometriosis occurring in a repaired perineal laceration. Eventually the tumor attained the size of an egg. At the time of menstrual periods it became swollen, tender, and blue, often a few drops of blood exuded from it. Six similar cases are quoted.

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smell The intelligence varies greatly, sometimes being normal and at other times subnormal, or, according to some authors, above normal.

No mention is made of treatment. Long ago Osler recommended decompression and ventricular puncture The abstractor believes that preventive neurology may be of value in craniostenosis

DAVID J. IMPASTATO, M.D.

EYE

Hagedoorn, A. • Paget's Disease of the Eyelid Associated with Carcinoma. *Brit J Ophthalm*, 1937, 21 234

A patient had been under treatment for trachoma for years The left eye together with the posterior part of the lids was removed A xerosis of the conjunctiva was found together with infiltration of lymphocytes and plasma cells beneath the xerotic epithelium The cells filling the meibomian glands strongly resembled those of basal-cell carcinoma One year later the patient returned complaining of a small tumor under the upper eyelid No other tumor or metastasis could be found. A complete exenteration was done. The tumor was a carcinoma The condition of the lid simulated Paget's disease with some features resembling Bowen's disease and a nodule which proved to be a carcinoma

VIRGIL WESCOTT, M.D.

Frost, A. D.: Leiomyoma of the Iris. *Am J Ophthalm*, 1937, 20 347

In a review of the literature, Frost found only one other authentic case than his own of leiomyoma of the iris His was the second case in which the pathological findings were sufficiently definite to justify this diagnosis The other case was reported in 1923, by Verhoeff, who reviewed the literature and contributed an excellent description of the pathological histology of this lesion

Two cases which have since been reported as leiomyoma by Velhagen and by Bossalino are questionable in that neither of these authors demonstrated the presence of the characteristic myoglia fibrils by differential staining

Clinically, leiomyoma is relatively benign Its outstanding pathological characteristics include a structure of interlacing, closely packed bundles of spindle cells with rod-shaped nuclei in palisade arrangement, displaying eosinophilic cytoplasm and myoglia fibrils

LESLIE L. MCCOY, M.D.

Anderson, R. G., and Gray, E. B.: Spasm of the Central Retinal Artery in Raynaud's Disease: Report of a Case. *Arch Ophthalm*, 1937, 17 662

Ocular complications in Raynaud's disease are infrequent, and spasm of the central retinal artery is exceedingly rare

The cause of Raynaud's disease is not known The disease passes through three stages, local syncope, local asphyxia, and local gangrene The first is characterized by vasoconstriction which

makes the affected parts pale and cold. The fingers and toes are the parts usually involved; but the disease may affect the ears, nose, lips, chin, and nates. There is a feeling of deadness usually accompanied by severe pain and paresthesia of the parts This stage is followed by local asphyxia or cyanosis. The asphyxia may persist for weeks or months before gangrene starts The parts are usually affected symmetrically. The disease is seldom fatal

The authors review the history of ocular involvement in Raynaud's disease and then report a case in which there seemed to be no doubt as to the diagnosis as the patient had been seen by many physicians who concurred in the diagnosis

Immediate hospitalization for possible lumbar and cervical sympathectomy in this case was refused, and when the patient was last seen the vision of the right eye was the barest perception of light in a small area in the temporal field. The fundus picture was unchanged. The patient had not been bothered with coldness of his toes and fingers for three weeks and was still taking potassium iodide.

LESLIE L. MCCOY, M.D.

EAR

McNally, W. J., Erickson, T. C., Scott-Moncrieff, R., and Reeves, D. L.: Clinical Observations on Bone Conduction. *J. Laryngol. & Otol*, 1937, 52 295, 375

The purpose of this research was to investigate the acuity of bone conduction in a series of patients in whom the presence of an intracranial lesion had been proved either at operation or post mortem Complete hearing and vestibular tests were made before and after operative procedure, and extreme care was used in selecting the instruments for testing the hearing. The clinical material comprised fifty patients with known intracranial lesions

The material was divided into five groups, the first group comprising patients on whom encephalography and ventriculography were being done. In this series no appreciable change in the hearing was noted in any patient examined within twenty-four hours following either of the two procedures. It must be concluded that procedures which presumably cause changes in intracranial pressure do not affect the hearing

Nine patients were examined following removal of cerebral tissue Seven showed a slight loss of hearing but this could not be associated with any special brain lesion.

In the fourth group, comprising patients with tumors and abscesses of the cerebellum, three showed a slight loss of hearing In a single case of tumor of the cerebellopontine angle, the hearing improved postoperatively

In eight cases of nerve tumor all of the patients had pre-operative high-grade nerve deafness and gave no vestibular response

In the summary the authors state that twenty-two of thirty-seven patients suffered some loss of hearing,

ABSTRACTS OF CURRENT LITERATURE

SURGERY OF THE HEAD AND NECK

HEAD

Sear, H. R. Some Notes on Craniostenosis *Brit J Radiol* 1937 10 445

The premature fusion of one or more sutures of the skull causes craniostenosis. In this condition the skull growth is not in proportion to the growth of the brain resulting in a skull which is too small for its contents. According to which suture or sutures become fused the skull becomes differently shaped such as steepie shaped or acrocephalic egg shaped or oxycephalic turret shaped or turriccephalic boat shaped or scaphocephalic, asymmetrical or plagiocephalic. According to the author and others craniostenosis is essentially a dystrophy of the membranous bones. However since in achondroplasia there is a definite craniostenosis of the bones of the cartilaginous base of the skull it might be clearer if we call craniostenosis of the vault, membranous craniostenosis and that of the base cartilaginous craniostenosis.

There have been many theories regarding the cause of craniostenosis of which the theory of Riepinga seems the most plausible. He believes that the malformations are determined by a variation in the germ plasma and cause a dislocation toward the sutures of the primary ossific centers. The moving of these primary ossific centers toward the sutures causes the premature fusion. That heredity plays a part in the etiology of this condition is strongly supported by Crouzon's description of

hereditary craniofacial dysostosis which is one of the forms of craniostenosis.

The degree of deformity in craniostenosis varies greatly. In some cases none is apparent while in others such as oxycephaly with its high short broad head flattened occiput and protruding slanty eyes the deformity is marked and typical. Craniostenosis usually begins in early infancy and stops at the time that bone growth ceases. Hydrocephalus spina bifida, meningocele, hypertelorism or wide spacing of the eyes and webbed hands or feet are often found with craniostenosis.

The x ray findings consist of more or less deformity of the skull, premature fusion of one or more sutures thinning and thumbing of the vault and alterations in the basal angle of Welcher which may be flat kyphotic or invaginated.

Among the clinical manifestations of craniostenosis besides the deformity may be mentioned periodic headache, convulsions, psychic anomalies and defects in the senses of sight, hearing and



Fig 1 Marked oxycephaly in the infant



Fig 2 Craniostenosis scapho-plagio-cephaly

an unavoidable injury of one of the large vessels of the hard palate with resultant thrombosis, (2) an idiosyncrasy of the patient to adrenalin; and (3) an internal disease of the patient in its early stages, which the patient keeps from the knowledge of his dentist, such as, lues or diabetes, and which is not usually recognized without more intensive examination (GERLACH) JACOB E. KLEIN, M.D.

Martin, H. E.: Peroral X-Radiation in the Treatment of Intra-Oral Cancer. *Radiology*, 1937, 28 527.

Intra-oral malignancies are generally not very sensitive to irradiation and therefore they require both external and interstitial exposure for their control in most cases. In this combination of methods, the external irradiation is given first in daily divided doses over a period of from two to three weeks, and is then followed immediately by the implantation of a small or moderate dose of radon seeds. Adequate dosage is commonly attended by certain untoward effects, both immediate and remote in the adjacent normal tissues, and it was with a view towards obviating these as much as possible when roentgen rays are used, that the author devised the technique described in this article.

One of the best methods of prevention is to employ the open mouth as the portal of entry so that a narrow beam of roentgen radiation strikes the tumor area without first traversing an overlying layer of normal tissue. An essential factor in doing this is the use of metal cylinders attached to the tube-holder, which serve to separate the lips and jaws, to retract certain normal intra-oral structures in the approach to the tumor, to limit the beam of radiation to the desired area and volume, and to insure its correct direction to the tumor. For this purpose metal cylinders of brass tubing lined with lead, in various sizes (2.5, 3, 3.5 and 4 cm in diameter), were constructed. All of these fit into a master cylinder or cone so as to be readily interchangeable. The various shapes and sizes are illustrated. Also several positions of the patient for treatment of lesions in different locations are shown.

In selecting cases for treatment by this technique, one should make certain that the growth is of suitable size and position to be approached through the open mouth. The exact factors of the technique are decided upon and recorded before the patient is taken to the roentgen-treatment room. Each case will require its own modifications and adjustments. The set up for various lesions is illustrated and shown diagrammatically.

In superficial lesions 100-kv rays are used, but for most cases 200-kv rays are used. The size of the total dose will depend on a number of factors, such as the size of the portal, the position and histological character of the growth, and the intended supplementary dose of seeds. In the average case, such as a tumor 2.5 cm in diameter on the lateral border of the tongue, the author would use a cylinder 3 cm

in diameter, and apply a daily dose of from 200 to 250 r up to 20 times for a total dose of from 4,000 to 5,000 r, and immediately thereafter would implant from 6 to 8 millicuries in seeds. For larger portals, 4 cm in diameter, in the same location, the dose is reduced to from 150 to 200 r daily for a total of from 3,000 to 4,000 r in the same period. Smaller portals, 2.5 cm in diameter, may be given from 350 to 400 r daily for a total of 6,000 r or more. The doses are measured in air at the target-skin distance.

The author makes no claim for priority of the method advocated. He has used it with numerous variations of technique since 1931 and finds it of great value in most tumors of the oral cavity. With it he has observed marked decrease in the incidence and extent of complications due to irradiation.

ADOLPH HARTUNG, M.D.

NECK

Maes, U., Boyce, F. F., and McFetridge, E. M.: Further Observations on Thyroid Disease in a Non-Endemic Area. *Ann. Surg.*, 1937, 105, 700.

The authors report a series of 662 cases of thyroid disease of which 341 were reported previously. Goiter in Louisiana is non-endemic except in certain regions.

Roughly half of the cases occurred in negroes; but while in the first series half of the goiters in the negroes were toxic, in the second series only about one-third were toxic. The operative mortality in the negro remained stationary at around 12 per cent, while the white mortality dropped from 9.6 to 2.8 per cent. In women the incidence and severity of the thyroid toxicity rises in proportion to the admixture of white blood, but thyroid disease in the coal-black male negro seems to be much more severe than in the mulatto. The operative mortality of toxic goiter in the male negro is 28.6 per cent.

Sixteen of the deaths from the thyroid disease were medical, all of the patients had been admitted in a hopeless state. As most of the deaths are due to liver dysfunction, the authors selected the hippuric-acid test as a test for liver function, which has proved valuable from a prognostic, pre-operative, and postoperative point of view. However, this test did not indicate other types of visceral damage, such as congestive heart failure or respiratory failure.

FRED S. MODERN, M.D.

Schipsatshoff, W. G.: Epidemic Goiter (Zur Frage des epidemischen Kropfes). *J. internat. de chir.*, 1937, 2, 157.

Schipsatshoff states that during the past few years little attention has been paid to epidemic goiter. Eighteen years ago he had the opportunity to observe in East Siberia two cases of acute strumitis. He found that immigrants and freshly imported domestic animals were attacked by the disease shortly after their arrival. It was peculiar to note that these outbreaks occurred in early and late autumn, i.e., at the onset of the cold season.

but the loss of hearing was not typical of the brain lesion except in the cases of the eight nerve tumors.

Three methods were used in testing bone conduction, i.e. with the monochord, the audiometer, and the tuning fork. One method was no more suitable than the other. The 512 fork is best for bone conduction and the monochord necessary for checking the upper tone limit. Accurate results can be given only after all three tests and air tests by masking have been made.

JOHN F. DALRYMPLE, M.D.

MOUTH

Kaplan, I. I. Radiation Therapy of Malignant Lesions of the Lip. *Radiology* 1937 23 533

The treatment of the malignant lip is based upon the age of the patient, the position, extent, and site of the lesion, whether or not the lesion is ulcerated and infected, and whether or not lymphatic glandular involvement is present. The younger the patient the more drastic is the treatment required to control the malignant process. In older patients with localized lesions surgery with postoperative irradiation is often the method of choice.

In most of the 160 cases treated by the author the lip lesion was a squamous cell epithelioma. Treatment was carried out either by surgery and irradiation or by irradiation alone. In all cases it was begun with irradiation of the gland area of the neck and draining of the lip lesion, which was followed by local treatment of the lip. Irradiation of the glandular areas of the neck may be done with high voltage roentgen rays or radium in the form of a pack. Details of the technique and dosage are given in connection with both agents. When node dissection in the neck has been decided upon, pre-operative roentgen therapy of 150 r units to each side on six consecutive days is followed by surgery within three weeks.

Following irradiation of the lymph node areas of the neck, the local lesion is treated with surgery, radium, or roentgen rays, or a combination of these. In cases in which the lesion of the lip is localized with slight induration, and in old persons with small localized lesions in which no metastatic involvement is visible or palpable, the entire malignant area may be removed by surgical excision. After healing of the local wound, radium may be applied to the area of operation with a molded surface applicator of wax or rubber and left in place for a sufficient time to deliver the required predetermined dose. The dose depends on the extent and type of the original lesion and the amount of surgery performed in its removal. In cases in which block dissection of the lymph nodes of the neck is carried out simultaneously with or subsequent to the local lip resection, postoperative high voltage roentgen therapy is given to the neck.

When the local lesion is to be treated with radium, the method employed depends on the location and extent of the lesion. Small localized areas may be treated by the application of surface molds or direct contact application of gold seeds. Both of these

methods are described in detail. Local lesions may also be treated by the implantation of radium, radon needles or radon gold seeds. The technique followed is given at length. Occasionally when there is a large bulky tumor growth, removal of the extensive malignant tissue with endothermy followed by radium therapy, is advisable.

In cases in which radium is not available or in which there is a very large ulcerating infectious bulky tumor, involvement of the lip, intensive roentgen therapy may be administered. Detailed information of its application is included.

Recurrences occasionally appear at the site of the previously healed lesion or just beyond its periphery. When small they may be eradicated with surgery and the remaining malignant tissue may be treated with irradiation or by the insertion of small radon contact seeds.

In cases in which neck nodes persist after irradiation, the nodes may be removed surgically or treated with interstitial radium therapy.

A study of his cases led the author to the following conclusions:

Carcinoma of the lip is most commonly present in males over forty years of age. It rarely occurs on the upper lip. Chronic irritation is an important cause. Excessive smoking has been indulged in by most of those so afflicted.

Syphilis has little influence as only a very small number of the patients, less than 2 per cent, gave a positive Wasserman reaction.

Metastatic lymph nodes were not common concomitant occurrences and when present indicated advanced disease with a poor prognosis. Local recurrence and metastasis were infrequent sequelae in cases which did not exhibit lymph node involvement before the local lesion was treated. Lymph node metastasis occurred infrequently in cases in which the local lesion had been completely eradicated by intensive treatment.

The results of irradiation in earlier of the lip based on the study of 160 cases compared favorably with those following surgery, with the added advantage of showing no immediate operative mortality. Moreover, mutilating scars are very much less likely to occur following irradiation.

ADOLPH HARTUNG, M.D.

Romeyk, A. The Genesis of Necrosis of the Hard Palate after Local Anesthesia. (*Zur Genese der Nekrosen am harten Gaumen im Anschluss an die örtliche Betäubung*). 1936 Cologne Dissertation.

The author considers in detail the various possibilities of the development of necrosis of the hard palate, which were also pointed out in the work of Wassmund and Hammer. The author is of the opinion that a number of causes considered by the latter authors are no longer allowed to occur in the light of our present knowledge in the field of dentistry. After serious study of the question he concludes that there are only three possibilities which explain the occurrence of necrosis of the palate: (1)

an unavoidable injury of one of the large vessels of the hard palate with resultant thrombosis; (2) an idiosyncrasy of the patient to adrenalin; and (3) an internal disease of the patient in its early stages, which the patient keeps from the knowledge of his dentist, such as, lues or diabetes, and which is not usually recognized without more intensive examination (GERLACH) JACOB E. KLEIN, M.D.

Martin, H. E.: Peroral X-Radiation in the Treatment of Intra-Oral Cancer. *Radiology*, 1937, 28. 527

Intra-oral malignancies are generally not very sensitive to irradiation and therefore they require both external and interstitial exposure for their control in most cases. In this combination of methods, the external irradiation is given first in daily divided doses over a period of from two to three weeks, and is then followed immediately by the implantation of a small or moderate dose of radon seeds. Adequate dosage is commonly attended by certain untoward effects, both immediate and remote in the adjacent normal tissues, and it was with a view towards obviating these as much as possible when roentgen rays are used, that the author devised the technique described in this article.

One of the best methods of prevention is to employ the open mouth as the portal of entry so that a narrow beam of roentgen radiation strikes the tumor area without first traversing an overlying layer of normal tissue. An essential factor in doing this is the use of metal cylinders attached to the tube-holder, which serve to separate the lips and jaws, to retract certain normal intra-oral structures in the approach to the tumor, to limit the beam of radiation to the desired area and volume, and to insure its correct direction to the tumor. For this purpose metal cylinders of brass tubing lined with lead, in various sizes (2.5, 3, 3.5 and 4 cm. in diameter), were constructed. All of these fit into a master cylinder or cone so as to be readily interchangeable. The various shapes and sizes are illustrated. Also several positions of the patient for treatment of lesions in different locations are shown.

In selecting cases for treatment by this technique, one should make certain that the growth is of suitable size and position to be approached through the open mouth. The exact factors of the technique are decided upon and recorded before the patient is taken to the roentgen-treatment room. Each case will require its own modifications and adjustments. The set up for various lesions is illustrated and shown diagrammatically.

In superficial lesions 100-kv. rays are used, but for most cases 200-kv. rays are used. The size of the total dose will depend on a number of factors, such as the size of the portal, the position and histological character of the growth, and the intended supplementary dose of seeds. In the average case, such as a tumor 2.5 cm. in diameter on the lateral border of the tongue, the author would use a cylinder 3 cm.

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The author makes no claim for priority of the method advocated. He has used it with numerous variations of technique since 1931 and finds it of great value in most tumors of the oral cavity. With it he has observed marked decrease in the incidence and extent of complications due to irradiation.

ADOLPH HARTUNG, M.D.

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Maes, U., Boyce, F. F., and McFetridge, E. M.: Further Observations on Thyroid Disease in a Non-Endemic Area. *Ann. Surg.*, 1937, 105: 700.

The authors report a series of 662 cases of thyroid disease of which 311 were reported previously. Goiter in Louisiana is non-endemic except in certain regions.

Roughly half of the cases occurred in negroes; but while in the first series half of the goiters in the negroes were toxic, in the second series only about one-third were toxic. The operative mortality in the negro remained stationary at around 12 per cent, while the white mortality dropped from 9.6 to 2.8 per cent. In women the incidence and severity of the thyroid toxicity rises in proportion to the admixture of white blood, but thyroid disease in the coal-black male negro seems to be much more severe than in the mulatto. The operative mortality of toxic goiter in the male negro is 28.6 per cent.

Sixteen of the deaths from the thyroid disease were medical, all of the patients had been admitted in a hopeless state. As most of the deaths are due to liver dysfunction, the authors selected the hippuric-acid test as a test for liver function, which has proved valuable from a prognostic, pre-operative, and postoperative point of view. However, this test did not indicate other types of visceral damage, such as congestive heart failure or respiratory failure.

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but the loss of hearing was not typical of the brain lesion except in the cases of the eight nerve tumors.

Three methods were used in testing bone conduction, i.e. with the monochord the audiometer and the tuning fork. One method was no more suitable than the other. The 512 fork is best for bone conduction and the monochord necessary for checking the upper tone limit. Accurate results can be given only after all three tests and air tests by masking have been made.

JOHN F. DELPH, M.D.

MOUTH

Kaplan, I. I. Radiation Therapy of Malignant Lesions of the Lip. *Radiology* 1937 28 535

The treatment of the malignant lip is based upon the age of the patient, the position, extent, and site of the lesion, whether or not the lesion is ulcerated and infected, and whether or not lymphatic glandular involvement is present. The younger the patient the more drastic is the treatment required to control the malignant process. In older patients with localized lesions surgery with postoperative irradiation is often the method of choice.

In most of the 160 cases treated by the author the lip lesion was a squamous cell epithelioma. Treatment was carried out either by surgery and irradiation or by irradiation alone. In all cases it was begun with irradiation of the gland area of the neck and draining of the lip lesion, which was followed by local treatment of the lip. Irradiation of the glandular areas of the neck may be done with high voltage roentgen rays or radium in the form of a pack. Details of the technique and dosage are given in connection with both agents. When node dissection in the neck has been decided upon, pre-operative roentgen therapy of 150 r units to each side on six consecutive days is followed by surgery within three weeks.

Following irradiation of the lymph node areas of the neck, the local lesion is treated with surgery, radium, or roentgen rays, or a combination of these. In cases in which the lesion of the lip is localized with slight induration and in old persons with small local lesions in which no metastatic involvement is visible or palpable, the entire malignant area may be removed by surgical excision. After healing of the local wound, radium may be applied to the area of operation with a molded surface applicator of wax or rubber and left in place for a sufficient time to deliver the required predetermined dose. The dose depends on the extent and type of the original lesion and the amount of surgery performed in its removal. In cases in which block dissection of the lymph nodes of the neck is carried out simultaneously with or subsequent to the local lip resection, postoperative high voltage roentgen therapy is given to the neck.

When the local lesion is to be treated with radium, the method employed depends on the location and extent of the lesion. Small localized areas may be treated by the application of surface molds or direct contact application of gold seeds. Both of these

methods are described in detail. Local lesions may also be treated by the implantation of radium, radon needles, or radon gold seeds. The technique followed is given at length. Occasionally, when there is a large bulky tumor growth, removal of the excessive malignant tissue with endothermy followed by radium therapy is advisable.

In cases in which radium is not available or in which there is a very large ulcerating infectious, bulky tumor involvement of the lip, intensive roentgen therapy may be administered. Detailed information of its application is included.

Recurrences occasionally appear at the site of the previously healed lesion or just beyond its periphery. When small they may be eradicated with surgery and the remaining malignant tissue may be treated with irradiation or by the insertion of small radon contact seeds.

In cases in which neck nodes persist after irradiation, the nodes may be removed surgically or treated with interstitial radium therapy.

A study of his cases led the author to the following conclusions:

Carcinoma of the lip is most commonly present in males over forty years of age. It rarely occurs on the upper lip. Chronic irritation is an important cause. Excessive smoking has been indulged in by most of those so afflicted.

Syphilis has little influence as only a very small number of the patients, less than 2 per cent, gave a positive Wasserman reaction.

Metastatic lymph nodes were not common concomitant occurrences and, when present, indicated advanced disease with a poor prognosis. Local recurrence and metastasis were infrequent sequelae in cases which did not exhibit lymph node involvement before the local lesion was treated. Lymph node metastasis occurred infrequently in cases in which the local lesion had been completely eradicated by intensive treatment.

The results of irradiation in cancer of the lip based on the study of 160 cases compared favorably with those following surgery, with the added advantage of showing no immediate operative mortality. Moreover, mutilating scars are very much less likely to occur following irradiation.

ADOLPH HARTUNG, M.D.

Romeyk, A. The Genesis of Necrosis of the Hard Palate after Local Anesthesia. (*Zur Genese der Nekrosen am Harten Gaumen im Anschluss an die örtliche Betäubung*) 1936 Cologne Dissertation.

The author considers in detail the various possibilities of the development of necrosis of the hard palate, which were also pointed out in the work of Wassmund and Hammer. The author is of the opinion that a number of causes considered by the latter authors are no longer allowed to occur in the light of our present knowledge in the field of dentistry. After serious study of the question he concludes that there are only three possibilities which explain the occurrence of necrosis of the palate: (1)

an unavoidable injury of one of the large vessels of the hard palate with resultant thrombosis; (2) an idiosyncrasy of the patient to adrenalin; and (3) an internal disease of the patient in its early stages, which the patient keeps from the knowledge of his dentist, such as, lues or diabetes, and which is not usually recognized without more intensive examination (GERLACH) JACOB E. KLEIN, M.D.

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The first noticeable symptom was a swelling of the thyroid gland. The condition was further characterized by dilatation of the blood vessels of the neck and puffiness of the face. The pulse rate varied between 120 and 130 per minute, there were tremors irritability dermatographia and in a few cases enlargement of the salivary glands. The clinical picture resembled most closely that of a formes frustes of Basedow's disease. The white blood count revealed a leucocytosis and the red count showed in the human being an increased color index accompanied by anisocytosis polychromatophilia and an increased number of reticulocytes.

The pathological picture was that of a parenchymatous goiter with an irregular enlargement of the follicles. In the domestic animals the condition produced abortion in cows and the young were born completely naked.

Little is known about the cause of epidemic and endemic goiter. The three most common theories are (1) that there is an insufficient iodine intake (2) the toxic infectious theory, and (3) the infectious theory. In order to clarify the problem the author conducted a series of experiments to determine the rôle of cockroaches and bed bugs as carriers in the production of epidemic goiter. He found that in the aforementioned district the bread flour prepared dough and water were often contaminated with fecal material of cockroaches. He fed a series of rabbits and rats with fecal material of cockroaches and with molds cultivated from the feces. All of the experimental animals were imported from districts free from disease. The fecal material was finely ground with water mixed with oats and administered to the animals.

In this series of experiments the thyroid gland was found to be enlarged after twenty days and on histological examination the parenchyma of the gland had undergone hyperplastic changes. After forty days the gland was found to have reached its normal size again.

In a second series of experiments on white rats the animals were fed with molds cultivated from the fecal material of cockroaches. In this series the animals invariably developed severe thyroid lesions. Microscopic examination of the gland revealed a

severe hyperemia and a marked increase in its parenchyma in various places. The colloid was found to stain less intensely than in the control animals.

Blood collected from bed bugs which had fed on rabbits and injected into normal animals failed to produce the disease and blood from diseased individuals injected into normal subjects also gave negative results. The author concludes that in this condition there is apparently no virus which circulates in the blood. RICHARD E. SOMMA, M.D.

Parsons W. H. and Purks W. K. Total Thyroidectomy for Heart Disease. *Ann Surg* 1937 105 722

The authors tabulated data on 367 cases in which total thyroidectomy for heart disease has been performed. Information concerning complications was obtained in 281 cases. Tetany occurred in 30 (10.3 per cent) of the cases with one fatality. The recurrent laryngeal nerve was injured in 24 (8.2 per cent).

Two hundred and twenty nine operations were performed for congestive heart failure and 24 (10.48 per cent) were followed by death. Seventy-one (34.63 per cent) of the patients showed excellent results, 59 (28.78 per cent) showed moderate improvement. Six (2.92 per cent) were slightly benefited, and 69 (33.65 per cent) were not benefited. The various published statistics report improvement in 25 to 82.2 per cent of the cases.

One hundred and thirty three operations were performed for angina pectoris and were followed by death in 5 (3.75 per cent) of the cases. In this series 71 (55.46 per cent) of the patients showed excellent results, 36 (28.22 per cent) were moderately benefited, 5 (3.9 per cent) were slightly benefited and 16 (12.3 per cent) received no benefit whatever. These figures are in close agreement with published single statistics.

The indications for thyroidectomy must be considered carefully and it must be borne in mind that this procedure is only a form of symptomatic treatment which in no way alters the underlying cardiac pathology and substitutes one disease for another.

FRED S. MODERN, M.D.

SURGERY OF THE NERVOUS SYSTEM

BRAIN AND ITS COVERINGS; CRANIAL NERVES

Lysholm, E., Ebenius, B., and Sahlstedt, H.: The Ventriculogram. Part II The Lateral Ventricles (Das Ventrikulogramm II. Teil Die Seitenventrikel) *Acta radiol.*, 1937, Supp 25

Part II of this article deals with 398 cases of tumors or tumor-like conditions, which affected mainly the lateral ventricles, and had their origin in the cerebral hemispheres and their meninges, or in the central portions of the brain, excepting the third ventricle. In the great majority of these cases air was used as the contrast medium; lipiodol was used only in a few of the older cases. Experience has shown that expansive processes can be accurately localized by ventriculography with air almost without exception, provided that air is present in the lateral ventricle of the diseased side and that the amount of air is not too small. The ventriculographic pictures of tumors in a like localization seem to show so many common features, that the authors felt justified in grouping the material according to the changes observed roentgenologically. This grouping has a certain value in the development of a surgical plan of operation. However, it is emphasized that the different groups pass into each other without sharp limitations.

The following classification is adopted.

- A Tumors of the convexity (without dislocation of the temporal horn)
 - 1 Medial or parasagittal tumors
 - Group 1 Anterior frontal tumors
 - Group 2 Posterior frontal tumors
 - Group 3 Frontoparietal tumors
 - Group 4 Parietal tumors
 - Group 5 Occipital tumors
- 2 Lateral tumors (including tumors of the fissure of Sylvius)
- B Basal tumors (including temporal tumors)
 - 1 Subfrontal
 - 2 Suprasellar and intrasellar
 - 3 Anterior temporal
 - 4 Posterior temporal
- C Central tumors (arising from the corpus striatum, thalamus, and their immediate surroundings)
- D Intraventricular tumors
- E Tumors arising from the septum pellucidum and corpus callosum

growing secondarily into the ventricular system, as they themselves appear as a filling defect. This is true especially of the smaller tumors. It may be difficult occasionally to differentiate the filling defect which a large tumor filling the entire ventricular system produces, from a compression produced by an extraventricular tumor. When the contour of the tumor is not directly visible in the ventriculogram the tumor must be localized by the changes which the exerted pressure produces, primarily by the dislocation and the resulting deformation of the ventricular system.

A more or less lateral displacement of the ventricular system is characteristic of nearly all supratentorial tumors. The anterior horns and the cella media react to tumor pressure with lateral displacement, whereas the posterior portions, especially the posterior horns, are relatively fixed by their position to the side of the falx and above the tentorium. Usually, even in the presence of relatively wide dorsal tumors, a displacement of the anterior horns is seen, whereas the posterior horns show a lateral displacement only in the presence of occipital tumors. In addition, the third ventricle is slightly displaceable, but not in its anterior lower part, which characteristics lead to the oblique position usually seen in the frontal picture. It may be expected that almost always changes appear in the frontal picture in the neck posture in the presence of a tumor, even if it is not located in the most anterior part of the brain. This picture should, therefore, be studied first. A basal displacement of the anterior horns with simultaneous flattening of the lateral upper border of the ventricle on the healthy side represents the typical picture of a relatively far anterior, parasagittal tumor. In addition there is a more or less lateral displacement and a resulting oblique position of the septum pellucidum and the third ventricle.

A lateral displacement, without other deformity than that produced by the falx, gives no direct information as to the position of the tumor. For this information, further pictures are required to show the maximum dislocation and the position of the temporal horns. For the determination of the degree of lateral displacement in the different parts of the ventricular system, the semi-axial pictures are of greatest value. If the temporal horn shows no changes, a lateral tumor, the center of which corresponds to the maximum of displacement, is present. The more oblique the septum is, and the less the floor of the third ventricle is pushed aside, the more the position of the tumor nears the parasagittal. The lateral upper contour of the lateral ventricle is often rounded off in the presence of high-lying tumors of the convexity; with basal tumors it is occasionally drawn out sharply and the

lateral lower wall is projected more strongly into the ventricle. A more marked displacement of the floor of the third ventricle suggests a more basally lying tumor.

Changes in the anterior part of the temporal horn usually appear in frontal pictures in the occipital posture. The site of the tumor in the temporal lobe can be judged fairly accurately by the dislocation of the temporal horn, but it should be noted that an accurate localization is possible only with the aid of a semi axial picture in the neck posture and a lateral picture. The lateral ventricles show the deformity characterizing a basal lateral or central position of the tumor.

If in spite of a lateral displacement the upper contours of the lateral ventricle are on the same or nearly same level if the lateral upper part of the ventricle on the tumor side is drawn out and if its lateral wall shows an increased protrusion medially, the typical picture of a centrally lying tumor is presented. In these tumors the septum is usually vertical or shows a vault shaped deformity and the lateral displacement of the third ventricle is relatively great. A vault shaped deformity of the third ventricle also occurs. Lateral dislocation of the temporal horn shows wide dissemination of the tumor basally. A blocked foramen of Monro may also serve for localization of the tumor. If the third ventricle cannot be filled with air the differential diagnosis from tumor of this ventricle may occasionally be difficult. Symmetrical hydrocephalus suggests a tumor of the third ventricle.

Local deformities of the anterior horns are also observed in the presence of anterior frontal and subfrontal tumors. Displacement in a straight dorsal direction is characteristic of the former and a dislocation in a cranial direction together with an impression in the region of the lower border of the anterior horn characterizes the latter and usually also expansive processes in the region of the sella turcica. The behavior of the third ventricle also serves in the differentiation of these three groups. In cases of anterior frontal tumors the third ventricle usually shows no deformity in cases of subfrontal tumors its anterior upper contour is displaced basally and the ventricle is concave and lengthened by dorsal displacement of the region of the foramen of Monro. Tumors of the sella are characterized chiefly by a filling defect in the anterior lower part of the third ventricle. Consequently pictures may arise resembling those of tumor in the anterior part of the third ventricle. Zero-degree sagittal pictures of tumors in this locality taken in the occipital position often give less decisive evidence than those taken in a semi axial occipital position and a lateral picture taken in the occipital position or possibly in the axial position.

Expansive processes in the posterior parts of the hemispheres often also produce changes that are visible in sagittal pictures in the occipital posture but the pictures in the frontal posture are of the

greatest interest. The behavior of the ventricular system with tumors in various localizations in the posterior parts of the hemispheres is, to a certain degree, analogous to that when tumors are present in the anterior parts but as a result of other relationships between the falx and ventricular system a new factor in the developmental mechanism of the deformities must be mentioned. The posterior lower part of the falx has its greatest extent in the sagittal direction so that its anterior border reaches a frontal plane through the trigone. Stretched on both sides by the tentorium and fixed stiffly in the median plane the falx forms a fairly unyielding obstruction to dislocation of the posterior parts of the ventricular system in a lateral direction. Even when a posteriorly lying expansive process is the cause pressure in a lateral position will produce a more marked lateral displacement first in the anterior part of the trigone and in the parts of the ventricle lying in front of it. The posterior horns usually remain unaffected provided the tumor does not lie in the occipital lobe or in the most posterior part of the temporal lobe. Because of the difference in the displaceability pressure in a lateral direction leads to a marked stretching of the anterior parts of the trigone and of the most posterior part of the cella media. This deformity is seen best in semi axial pictures in the frontal posture. If it is very pronounced an incisura in the posterior upper contour of the stretched part which corresponds with the free edge of the falx is seen occasionally. This finding is observed particularly in the presence of a tumor lying anterior to the trigone and relatively far basal. It may lead to confusion with a tumor when the relationships mentioned above are not sufficiently observed.

A difference in level between the lateral ventricles in the region of the posterior horns and the trigonum is characteristic for dorsal parasagittal tumors. Local deformities may also indicate the position of the tumor. Special attention is called to the concavity of the medial contour of the trigone and posterior horn which occurs with tumors and lies between the c parts and the falx. This deformity is seen well in semi axial pictures in the frontal posture. A ventral displacement of the posterior horn and trigone is characteristic of occipital lobe tumors. This ventral displacement also produces a change in the position of the posterior part of the temporal horn which takes a more vertical position. When this dislocation of the posterior part of the temporal horn appears without marked dislocation of the posterior horn an expansive process in the posterior lower part of the temporal lobe is suggested. From a medially or laterally directed dislocation of the temporal horn conclusions may be drawn also as to the position of the tumor in relation to that of this horn.

Spreading apart of the lateral ventricles is characteristic of expansive processes which have originated from the septum pellucidum and corpus callosum, or have invaded them secondarily. An

increasing divergence in a cranial direction between the ventricles characterizes tumors of the corpus callosum, when the ventricles are pushed apart parallel or in the shape of a vault tumors of the septum-pellucidum are present

With symmetrical hydrocephalus, but without the changes mentioned above, the disease process should be sought in the region of the third ventricle, the aqueduct, or the fourth ventricle

In the determination of the type of tumor, great significance was attached to the width of the ventricle. It has been shown that in meningiomas the ventricle is usually not dilated, but in malignant gliomas the ventricle of the healthy side at least shows a greater dilatation. This difference is, naturally, not to be expected in tumors of the third or fourth ventricle. The hydrocephalus usually present with these tumors depends entirely upon the existing obstruction of passage, and is entirely independent of the nature of the obstruction.

In order to determine to what extent the width of the ventricular system is associated with the type of tumor 319 suitable cases were studied. In 70 per cent of the cases of meningioma none of the two lateral ventricles was dilated, for all the remaining tumors the corresponding figure was 59 per cent, and for the astrocytomas, glioblastomas, and closely related gliomas, together, it was 55 per cent. In 18 per cent of the meningiomas, in 20 per cent of all the remaining tumors, in 18 per cent of the astrocytomas, and in 28.5 per cent of the glioblastomas the ventricle of the healthy side was dilated. Even though dilatation of both lateral or contralateral ventricles is rarer in the presence of meningiomas than of glioblastomas, and may to a certain degree support the clinical diagnosis of malignant glioma, according to the authors' belief, the difference between these tumor groups in this respect is not great enough to justify the differential diagnosis between meningioma and glioma by means of the ventriculogram in the individual case. On the other hand, it seems to the authors that bony and vascular changes in the cranium and possibly also tumor calcifications are of value in the determination of the type of the tumor.

LOUIS NEUWELT, M D

King, J. E. J.: The Treatment of Brain Abscess Associated with Extracapsular Necrosis and Suppuration. *Arch Surg*, 1937, 34 631.

The experience gained in the treatment of two patients with abscess of the brain associated with extracapsular necrosis and suppuration forms the basis of this paper. The author has seen only two patients with such a lesion. Both were operated on and both recovered. Incomplete description of the autopsy findings may account for the infrequency of this type of lesion in the literature. The first case has already been reported. A complete report of the second case is given.

The patient had had attacks of severe frontal pain since childhood, especially on the left side. For the



Fig. 1. A schematic section of the lesions, showing extracapsular necrotic and suppurative brain substance; the very thick wall of the smaller anterior abscess, with the "stalk" leading downward and inward to the opening in ethmoid bone, and the posterior, and larger, abscess cavity, with a definite, but thinner wall which connects with the anterior cavity through an opening.

past seventeen years there had been a definite history of involvement of the frontal, ethmoid, and sphenoid sinuses with multiple irrigations and operations. A radical frontal-sinus operation in 1918 gave some relief from the frontal headaches, but the headaches in the sphenoid area became unbearable. Other intranasal procedures were done, and in 1920 mastoidectomy was performed on the left side. In 1928 a diagnosis of "intranasal neuralgia" as the cause of persistent pain in the left frontal region and the left orbit was made by a well known rhinologist. The patient believed that a focus of pus existed somewhere in the left ethmoid region, and Craig succeeded in finding a passage which led upward and apparently into a para-orbital cell below and to the outer side of the frontal sinus. Thereafter the treatment consisted in keeping this tract open so as to allow the drainage to continue. The severe headaches continued with an intense boring pain in the left orbit which suggested bone necrosis. In

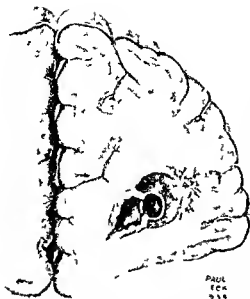


Fig 2 A schematic section of the lesions showing where the anterior half of the thick wall of the anterior abscess and its stalk were cut away and the opening about 1 cm in diameter between the anterior and the posterior abscess cavity. A considerable amount of brain substance between the lateral cortex and the abscesses was necrotic and contained pus. No connection between this area and the cavities was detected.

May 1934 the patient a physician found that the probe which he had been accustomed to pass into the drainage tract for slight relief of pain passed upward readily without interference far beyond the probable upper level of the frontal sinus. This event was unattended by any deleterious effects. During July and August 1934 he observed increasing weakness of the right hand attacks of pain in the joints excessive perspiration on exertion two attacks of vertigo and at least three attacks of fever lasting several days. On Sept. 29 1934 a consultation was held with Stuehlitz Kennedy Craig and Neal. After neurological examination the diagnosis made was abscess in the left frontal region with an extension implicating the left temporal lobe in some way. The presence of anomia was indicated by the fact that the patient could not remember the name of the man who had been his assistant in practice for many years.

Röntgenograms made with the probes inserted one toward the sphenoid region and the other toward the ethmoid region showed the anterior probe passing through a perforation in the ethmoid horizontal plate for a distance of 4.5 cm into the left frontal lobe. A small cannula was passed into the opening and a small amount of air was injected after which the cannula was withdrawn. Stereoroentgenograms

showed the presence of a multilocular cavity, with two distinct air shadows. An overlapping area was very definite and later proved to be the communication between the two abscessed cavities.

At operation an opening was made in the skull just above the supraorbital ridge. The cannula was inserted and at a depth of 1 cm met firm resistance by the capsule of the abscess. The nick in the dura was sealed by electrocoagulation and the trephine opening plugged to prevent infection during the operation on the ethmoid area. An incision was made by Craig following the approximate line of the old scar and was carried down to a probe which had been passed into the old sinus opening. The diseased area consisted of necrotic bone including the basal plate of the skull a part of which came away as a sequestrum. A posterior ethmoid cell and a cell of the middle ethmoid were also infected. All diseased bone was removed and the ethmoid cells were completely eliminated.

The dura was then fixed to the cortex by electrocoagulation after enlargement of the trephine opening in the frontal bone. The cortex overlying the anterior portion of the abscess capsule was sucked away. As the capsule was being exposed necrotic brain tissue about the anterior external and superior portions of the capsule was observed. The anterior half of the anterior capsule was removed. The abscess cavity contained thick yellow pus without a foul odor. The organism found was the streptococcus hemolyticus. A communicating opening at the upper posterior pole of the capsule led into the second abscess cavity. The anterior abscess had a sinus tract leading from its lower pole inward forward and downward to the ethmoid region. Necrotic bone in the horizontal plate of the ethmoid was removed.

The extracapsular necrotic brain tissue and pus were removed by suction. The excavation in the brain leading back along the posterior abscess cavity and the exposed lateral wall of the posterior abscess cavity was then removed. A strip of soft iodoform gauze was stuffed loosely into the remaining portion of the abscess cavity and a layer of iodoform gauze was then placed over the excavation. A fluffed gauze packing was then used to fill up the cavity. The flaps were replaced and loosely sutured and a dressing wet with a solution of sodium hypochlorite was applied over the entire area.

About five hours after the operation the patient stated that it was the first time in years that he had been free from pain in the head. The technique of subsequent dressings together with description of the use of the sodium hypochlorite solution is described in detail. The temperature varied between 99 and 100.5° F. the highest temperature was 100.8° F. on the first postoperative day. About four months after operation a small subperiosteal pocket over the outer margin of the cranial defect was opened under local anesthesia and two loose pieces of bone wax were removed. The patient recovered completely. He has no complaints and has resumed his practice.

EDWARD S. PLATT, M.D.

Elsberg, C. A., Davidoff, L. M., and Dyke, C. G.: The Roentgen Treatment of Tumors of the Brain in the Operating Room by Direct Radiation Through the Open Wound. *Bull. Neurol. Inst. New York*, 1937, 6: 19.

The authors report their experiences with radiation of brain tumors in the operating room through the open wound. It was hoped, by this method, to overcome the usual effects of heavy radiation to the scalp or bone and at the same time give the tumor sufficient radiation. They employed a 200,000 v., 25 ma. oil-cooled machine built into the operating room. The distance from the target to the end of the cone used was 50 cm. Because of the close proximity of the cone to the wound, the cone was sterilized.

A series of experiments consisting of radiation of the exposed cerebrum, cerebellum, or spinal cord, were conducted on monkeys. They found that a dosage of 5,000 r units or more exerted an injurious effect upon the cerebrum and cerebellum of macacus rhesus. A dosage of 3,000 r units did not produce any discoverable harmful effects over a period of four months after radiation.

On the basis of this experience patients were given no more than from 2,500 to 3,000 r units at a target distance of 50 cm. In the treatment of medulloblastomas of the posterior cranial fossa, the tube was brought near the surface of the growth, all filters were removed, and the kilovoltage lowered to about 100, to prevent deep penetration of the

medulla by the rays. Radiation was given after the growth had been exposed, and as much of the growth as possible was removed and all bleeding carefully controlled. The wound area was covered with cellophane and the rest of the head with from four to six layers of sterilized lead foil.

Eighteen patients received radiation in the operating room through the open wound. As far as the authors could determine from the immediate results of the radiation, there was no evidence of harmful effects. ROBERT ZOLLINGER, M.D.

Ehrlich, W.: Prolonged Fever Following the Removal of Large Tumors from the Posterior Cranial Fossa. *Bull. Neurol. Inst. New York*, 1937, 6: 33.

Six cases characterized by prolonged fever after the removal of deeply seated, large tumors of the cerebellum were reported in detail. The fever began within from one to four days following the operation, reaching 103 or 104 degrees, and 99 or 101 degrees in the morning. The febrile reaction persisted for more than five weeks in all of the patients, and the maximum duration was sixty-three days. As far as could be determined there was no evidence of infection in the wound or elsewhere in the patient. Repeated examinations of the spinal fluid contributed nothing. The fever did not respond to administration of the usual antipyretics or repeated lumbar puncture with withdrawal of the cerebrospinal fluid.

ROBERT ZOLLINGER, M.D.

SURGERY OF THE THORAX

CHEST WALL AND BREAST

Desmarest and Capitain. *The Treatment of Mastopathies with Acetate of Testosterone* (Le traitement des mastopathies par l'acétate de testostérone) *Presse méd* Par 1937 45 177

It has been the custom to operate on cases of cystic or nodular mastopathy because of the danger of cancerous degeneration. Even young women have been mutilated in this way.

The authors have tried a new treatment of these diseases of the breast. They give intramuscular injections of acetate of testosterone, a male hormone isolated from the testicles of the bull by Laqueur in 1935. Seventeen cases treated in this way are reported. Some of the patients had only painful congestion and enlargement of the breasts, while in some cystic degeneration had already taken place. In the first case there was a large adenomatous mass, surgical removal of which had been advised. There was only one failure among the seventeen cases, and that was in an old case of very advanced cystic disease.

From their results the authors conclude that the use of acetate of testosterone suppresses the congestive attacks of the breast preceding menstruation. It decreases and stops the development of chronic mastitis, particularly when the treatment is begun relatively early. It often brings about the disappearance of adenomatous nodules that have developed in a breast with chronic mastitis. It has a favorable effect on the attacks of pain and edema which occur in the course of development of cystic disease of the breast. It does not have a very pronounced effect on large cysts of long duration.

In the latter cases the authors advise puncture and evacuation of the cysts associated with treatment with injections of acetate of testosterone. They believe it is possible to prevent the development of cysts by arresting the attacks of congestion.

Surgery should not be used in these cases as it is mutilating and besides the cysts often recur after surgical operation. ALFRED GOSS MORGAN, M.D.

Weisswange, M. H. *The Problem of Irradiation Therapy in the Treatment of Carcinoma of the Breast* (Die Aufgabe der Strahlentherapie in der Behandlung des Mammacarcinoms) *Fragen und Antworten* 1936 7 513

The author discusses the principles of surgical irradiation treatment, the various techniques of irradiation and their results, and particularly the technique used in the Frankfurter University Institute for Radiation Therapy under Hohlfelder.

Operative therapy is successful in the early stages of carcinoma of the breast, rarely in the middle stages, and should not be attempted in the third and fourth stages.

Prophylactic pre-operative irradiation is not widely used, but the value of postoperative irradiation is established. A few foreign authors use irradiation alone even for operable tumors. When x-ray and radium irradiation are combined, the latter is used when particularly intensive irradiation is desired. X-rays are used for the total irradiation by the Hohlfelder tangential flanking method. Large fields are arranged against the wall of the breast so that only well homogenized marginal rays reach the breast wall.

The results of prophylactic postoperative irradiation from 1920 to 1932 were as follows: of 236 patients, 152 (64.4 per cent) were symptom free after three years; of 175 patients, 94 (53.7 per cent) after five years; of 125 patients, 54 (43.2 per cent) after eight years; and of 96 patients, 33 (34.4 per cent) after ten years.

A collection of 3 different series of cases treated by scattered individual dosages of irradiation over a two-year period for severe burns of the skin showed a decrease in good results in a year. A favorable general reaction was lost in these scattered dosages.

The treatment of inoperable tumors by irradiation with timely individual and larger fractional dosages gave the following results: of 51 patients, 21 (41.2 per cent) survived for three years, and of 40 patients, 9 (22.5 per cent) survived five years.

The treatment of metastases by x-ray irradiation has gained in importance, especially in metastases to the bones, which heal and become solid due to increased calcium deposits. Pleural and pulmonary metastases may heal with contraction of the healed lung tissue. Brain metastases may heal also, and a return of function even after paralysis may occur. Skin metastases are not influenced to any extent by irradiation treatment.

(STIEVERS) J. DANIEL WILLEMS, M.D.

TRACHEA, LUNGS AND PLEURA

Grüel, M., Hillebrand, I., Delarue, J., and Gaube, K. *Large Bullous Emphysema Simulating Congenital Pulmonary Cyst* (Emphyseme pulmonaire à grosses bulles simulant des kystes congénitaux du poumon) *Bull et mémoires Soc. méd. d'Alsace* 1937 55 478

The authors state that at present a diagnosis of congenital pulmonary cyst is usually made in patients whose pulmonary disturbances date back to infancy and in whom the roentgenogram shows slightly demarcated annular configurations.

The authors observed a thirty-eight-year-old man whose respiratory disturbances began in infancy and in whom the roentgenogram showed the characteristic appearance of a pulmonary cyst. The autopsy, however, revealed bilateral pulmonary lesions characterized primarily by a bullous emphysema which in certain areas was very extensive.

On section of the lungs, there were seen, besides the emphysema, lesions typical of a pulmonary sclerosis surrounding the broncho-arterial and peribronchovascular spaces. Furthermore, there were found at the apices small foci of pneumonia in the stage of gray hepatization. The entire base of the right lung, on the other hand, was diffusely condensed, containing cavities filled with pus. One of the branches of the right bronchus was obliterated by a tenacious substance and the air passage distal to it was collapsed.

Histological examination of the lungs revealed hyperplastic or atrophic and emphysematous changes of the alveolar system. The bronchi were intact. The apices were mostly sclerosed and presented pneumonic lesions in the stage of gray hepatization, and also old tuberculous lesions. At the bases of both lungs there were seen typical lesions of a hollow emphysema. At the base of the right lung there was a zone of atelectasis. The bronchi of the lower lobe were collapsed and the main trunk was obliterated by granulation tissue. The accompanying arteries presented lesions of a proliferative endarteritis and there were two thrombi surrounded by a recently infarcted area.

The authors summarize the course of events of this case by stating that in this individual affected with acquired pulmonary sclerosis with emphysema probably of tuberculous origin, the bronchial obliteration of unknown origin had determined an atelectasis and sclerosis of the greater part of the right lower lobe. After a more or less prolonged period, the atelectatic area became secondarily infected and gave rise to suppurating cysts, to the formation of arterial thrombi, and to a series of general complications which finally caused death.

The authors, on the basis of these observations, believe that our information concerning intrathoracic cysts should be thoroughly revised, and a diagnosis of congenital pulmonary cyst should be made cautiously. It should be borne in mind that besides true congenital cysts secondary pseudocystic lesions may be produced. RICHARD E. SOMMA, M.D.

Sinding-Larsen, C. M. F.: On the Collapse Treatment of Pulmonary Tuberculosis. *Acta med Scand*, 1937, Supp. 80

This article represents a careful study of 1,126 proved cases of pulmonary tuberculosis upon which some form of collapse therapy was attempted at Vejleborg Sanatorium, Denmark, during the years from 1906 to 1932. This series included approximately 35 per cent of the total number of patients discharged during this period. Follow-up studies were made in every case.

The author discusses the unsatisfactory nature of most reports on the results of collapse therapy, and in his study subjects his data to the most critical analysis. The mortality investigation was prepared according to statistical methods.

Particular attention was paid to the patients receiving pneumothorax and to those subjected to

thoracoplasty. The best results were obtained from effective artificial pneumothorax. Yet these were relatively few as the procedure was primarily technically effective in only 40 of 1,021 patients. Seventy-three additional good results were obtained as the result of intrapleural pneumonolysis. Among the 299 patients upon whom thoracoplasties were performed, 253 had demonstrable cavities. In 132 of these, closure was obtained before discharge. The results in this group were only comparable with those of partly effective pneumothorax. These poor results were thought to be due to the inadequacy of the operative procedures. Accordingly, the Semb type of operation was recently adopted. This provides for a freeing of the apex of the lung in addition to the extensive resection of the upper ribs, and allows apicocaudal as well as lateral collapse of the lung.

Intrapleural pneumonolysis was found to be of real value, but extrapleural plombage was highly unsuccessful. Diaphragmatic paralysis proved of very limited value in this series.

The author concludes that even with protracted treatment in private sanatoria, patients with cavernous pulmonary tuberculosis have a very poor prognosis if they do not receive effective collapse treatment in time. He believes that in order not to deny some patients their only chance of recovery, the indications for collapse therapy should be drawn less rigidly.

RICHARD H. MEADE, J.P.

Leuret, E., Nancel-Pénard, C., and Cluzel, P.: Dissection of Pleural Adhesions under Pleuroscopic Control in the Course of Therapeutic Pneumothorax (Section des adhérences pleurales sous contrôle pleuroscopique, au cours du pneumothorax thérapeutique). *J. de méd. de Bordeaux*, 1937, 114, 499.

Leuret and his associates find that artificial pneumothorax is necessarily incomplete if there are pleural adhesions that hold the lung fixed to the thoracic wall and prevent its complete collapse. It was to remedy this condition that Jacobaeus proposed his method for sectioning these adhesions with the galvanocautery, under pleuroscopic control. Jacobaeus devised a special pleuroscope for this operation, and used a galvanocautery with a platinum loop for cutting the adhesions. This pleuroscope has since been modified by Maurer and Gullhring. The method of cutting the adhesions has also been modified by the use of diathermy; Matson uses diathermic electrocoagulation, or a cutting current. Maurer combines diathermic electrocoagulation with the cutting effect of the galvanocautery, using a combined cautery with which either current may be employed, regulated by a system of pedals. In some cases Maurer employs a method of extrapleural detachment of the adhesion with this instrument.

The authors report that from December, 1934 to July, 1936, they have operated upon thirty-four tuberculous patients at the Sanatorium Xavier-

Arnozan in five of these cases only pleuroscopy was done, in the remaining twenty nine the adhesions were sectioned. General anesthesia with rectanol was employed. The tissues at the site where the incision is made for the introduction of the pleuroscope must be prevented from bleeding. A hemostatic fluid is applied to the skin around the incision, and the subcutaneous tissues are infiltrated with 1:1000 adrenalin solution. The Gullibring pleuroscope is used. While the authors have used the galvanocautery alone in a few instances, in most cases they prefer the combined use of diathermic coagulation and galvanocautery.

After operation, the patient must be kept from coughing for twenty four hours by the administration of morphine or pantopon. In forty eight hours the pressure in the pleural cavity may be determined manometrically. If necessary, an insufflation of air may be given or a small quantity of air may be withdrawn if the patient has dyspnea. Later re-insufflations of air to re-establish the pneumothorax are made with care.

The chief indication for the use of this procedure in tuberculous patients in whom artificial pneumothorax has been established is incompleteness of the pneumothorax as indicated by (1) persistence of the bacilli in the sputum (2) persistence of a cavity distended by the adhesion as shown in the roentgenogram, even if the sputum is negative and (3) persistence of signs of activity, such as fever and failure to regain weight. The presence of a pleural effusion may also be an indication for this operation. This was the case in two of the authors' patients. The best time for this operation is from the second to the fourth month of the pneumothorax; the best results were obtained in cases operated upon in the second month.

In 46.8 per cent of the authors' thirty four cases pleural effusion developed after operation but in most cases the effusion was non-purulent and was absorbed rapidly; the authors regard such effusion as a reaction of the pleura to the irritation of the operative procedure.

In the authors' series of cases permanent good results were obtained in sixteen (65.5 per cent) of the cases; temporary good results in three cases and no improvement in three cases. There were seven cases with postoperative complications including two cases with perforation of the lung, two cases with hemorrhage, two cases with postoperative symphysis and purulent pleurisy involving loss of lung tissue and one case of purulent pleurisy. The authors state this percentage of complications is too large; it may be attributed partially to faults in technique but equally as much to a poor selection of cases. One of the cases of perforation of lung which was fatal occurred in a febrile patient with bilateral pneumothorax. The authors are of the opinion that it is dangerous to attempt operation in a case of this type. Their percentage of permanently good results (65 per cent) agrees with the results reported by others.

WILLIAM M. MEYER

Frissell L. F. and Knox L. C. Primary Carcinoma of the Lung. *Am J Cancer* 1937 30 219

Primary carcinoma of the lung is not the rare disease that it formerly was believed to be, but the question as to whether the increase is real or apparent is still open to debate. It must be taken into account that many tumors classified as carcinomas by pathologists of the previous century are now called epithelial tumors of the so-called oat cell variety and carcinoma of the lung formerly was usually considered metastatic. Also, the widespread interest of pathologists in this subject has led to the discovery of a considerable number of small pulmonary neoplasms with large metastases such as were undoubtedly regarded by earlier observers as the primary lesions. These authors believe that the increase in the incidence of bronchial carcinoma in the past two decades is apparent rather than actual.

Etiologically, carcinoma of the lung must be dependent in general on the same causes as carcinoma elsewhere. In this series of cases occupation did not play a significant part. There were no miners in the group and only three of the patients had been engaged in dusty occupations: a bricklayer, a baker and a fireman. Neither were the habits of the patients of significance except for the well known universal use of tobacco. One patient had been a victim of war gas. Ten patients were females, thirty six were males.

The onset of pulmonary carcinoma may be exceedingly insidious. In ten cases only could a history of over one year be elicited though in two others asthma had been present for many years.

Carcinoma of the lung is almost entirely a disease of middle and later life. By far the largest number of cases occur between the ages of fifty and seventy years. The ages in this series ranged from seventeen to sixty nine years.

Primary tumors of the lung are more frequent on the right side than on the left. In this series 27 per cent involved the main bronchus, 4 per cent were peripheral, 2 per cent bilateral, 32 per cent were located in the right upper lobe, 13 per cent in the left upper lobe, 11 per cent in the right lower lobe and 15 per cent in the left lower lobe.

The classification based upon an anatomical or descriptive basis includes five types: (1) the central or hilus type 49.7 per cent, (2) the nodular parenchymatous type 17.8 per cent, (3) the peripheral type 6.5 per cent, (4) the diffuse type 23.9 per cent and (5) the bilateral hilary type 2.1 per cent.

Carcinoma of the lung is one of the tumors which metastasizes most widely involving organs not frequently affected by tumors arising elsewhere as for example the suprarenal glands and the brain. In this series of forty six cases all except one (97.4 per cent) showed metastases at least to the regional lymph nodes. This one exception was a papillary tumor which in its histology as well as in the absence of metastases is comparable to basal-cell tumors elsewhere. Although it formed a large mass it had not metastasized. Next to the peribronchial or hilus



Fig 1 Squamous tumor showing pearl formation.



Fig 2 Adenocarcinoma showing well-formed glands.

nodes, the liver is the most frequent site of metastases. The distribution in this series was as follows: nodes 97.4 per cent, liver 48 per cent, lungs 25 per cent, right suprarenal gland 25 per cent, left suprarenal gland 20 per cent, both suprarenal glands 15 per cent, bones 27.5 per cent, peritoneum 7.5 per cent, skin 7.5 per cent, kidney 7.5 per cent, spleen 5 per cent, heart 5 per cent, ovary and uterus 5 per cent, pancreas 2.5 per cent, bladder 2.5 per cent, and prostate 2.5 per cent. The brain had metastases in three of five cases examined at autopsy. It is now almost universally accepted that the cells of pulmonary carcinoma are derived from the mucous membranes of the bronchi or bronchioles. The lining of the bronchi consists of a columnar ciliated epithelium with goblet cells in between the epithelial cells, thus forming the pseudostratified respiratory epithelium. Mucous and mucoserous glands are found in all portions of the bronchial tree containing cartilage. This affords three adult modifications of lining epithelium from which cuboidal, mucus-producing, or papillary adenocarcinoma may arise.

The number of groups of pulmonary carcinoma which may be recognized histologically varies according to different writers. These authors deem it preferable to accept a simple classification, as follows: (1) squamous, (2) adenocarcinoma, and (3) undifferentiated, of two sub-types, (a) carcinoma simplex including the polymorphous types with large giant cells, medullary types with small oval cells, cuboidal and cylindrical cells without acinus formation, and basal cells, and (b) small spindle-cell, or so-called oat-cell, and round-cell types.

The squamous type of cell was found in 30.4 per cent of the cases. The morphology varies. In some keratinization with extensive softening and necrosis is prominent, and there may be well developed inter-

cellular bridges, or the malpighian layer may predominate. More frequently the differentiation is less complete and only small imperfect pearls and groups of pavement cells with early keratinization indicate the metaplasia which is in progress. Transitional cells may alternate with any of these forms. Among the fourteen cases of squamous tumor observed by the authors metastases were found in the bronchial nodes in all cases in which autopsy was performed, in the cervical nodes in two, and in the pleura, ribs, ilium, spine, axillary nodes, liver, and



Fig 3 Oat-cell tumor



Fig 4 Small-cell tumor resembling lymphosarcoma

adrenal glands. An extensive local spread may take place with infiltration of the pericardium and pulmonary vein and constriction of the superior vena cava and the pulmonary artery. These tumors also metastasize to the brain. Squamous tumors may arise in any portion of the lung and the morphology has nothing to do with the level of origin that is squamous columnar or undifferentiated tumors are not found exclusively in any one location.

The adenocarcinomas constituting 26 per cent of this series include those tumors which show definite palisading around a central glandular lumen, a tendency to replace the lining cells of the pulmonary alveoli, or to form throughout low columnar cells usually with the production of considerable amounts of mucus. Small areas from one portion of the tumor may appear definitely cuboidal while in some other portion of the primary growth or metastatic deposits the cells may be much more detached and no true glands may be detected. Included with the adenocarcinomas are mucous cell carcinomas since the authors believe that as the mucous cells lining the bronchi have taken their origin from the same covering epithelium as that of the bronchi and are merely a more specially differentiated form of the same cells no group distinction should be made between the columnar cells and the mucous cells. The same high degree of differentiation may take place in metastases in which the lesions in the adrenal glands and metacarpal bone showed the same highly differentiated mucus producing cells.

Of special interest is the bilateral hilar tumor. The cells of this tumor were unusually tall columnar

cells secreting fairly large amounts of mucus. In this type of tumor single lobules appear to be distended and filled with glairy grayish mucus producing cells distributed throughout both lungs.

The adenocarcinomas are among the most rapidly growing and widely metastasizing of the lung tumors through their rapid extension by direct implantation and by the lymphatics whole lobes or even a whole lung may become involved and as it consolidates it closely resembles a gray hepatization of lobar pneumonia thus forming the so called pneumonic form of carcinoma.

The largest group of lung carcinomas is made up of the undifferentiated types which comprise 41 per cent of this series as follows: oat cell four cases, small cell seven cases, cuboidal cell three cases, polymorphous four cases, and basal cell one case. There is no important distinction between the small cell and the oat cell types, one or the other type of cell may predominate in different parts of the same tumor and its metastases. These small-cell tumors may closely resemble lymphosarcoma and undoubtedly in many instances have been so designated in autopsy statistics. The massive metastases of these tumors are usually associated with large masses in the posterior mediastinum and anterior displacement of the trachea. They also readily spread to the abdominal nodes. Bone and brain metastases are also frequent.

Even in tumors composed chiefly of minute spherical cells one finds some of the giant multinucleated cells in the primary growth indicating that these are undoubtedly degenerative forms. The polymor-

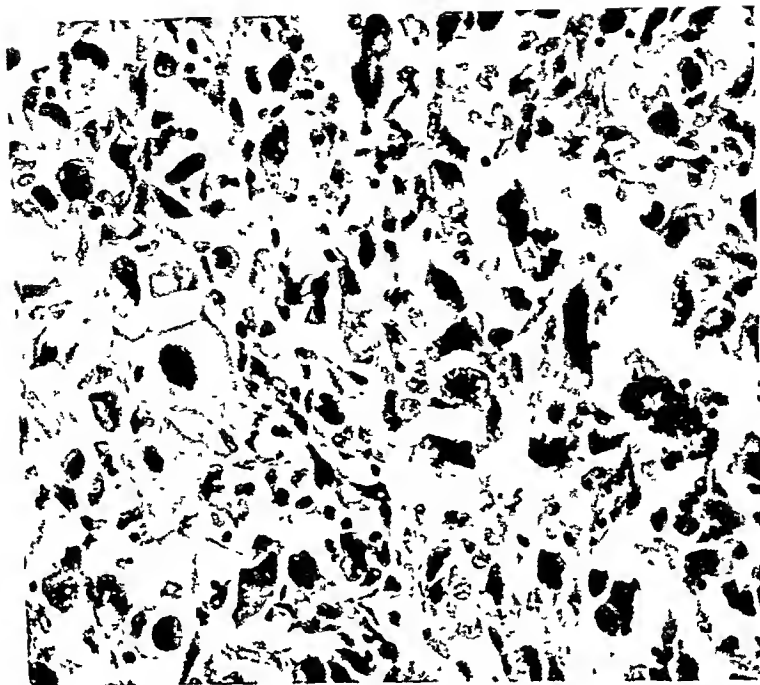


Fig 5 Undifferentiated polymorphous-cell tumor

phous group, therefore, is to be regarded only as a slight morphological variation from the other undifferentiated tumors. They possess the same biological characteristics and metastasize widely both to the chest and to more remote organs. The giant nuclei seen in this polymorphous group appear to be the most frequent in the suprarenal metastases, but are often found in the primary tumor as well. These large cells present some question as to diagnosis, but Masson stains indicate that they are epithelial, associated with very little stroma, and the form of the giant cells is the same as those sometimes seen in poorly nourished areas even in the small-cell group.

The cuboidal types possess much larger rounded or irregular nuclei, often growing in the form of delicate strands and thus slightly suggesting a papillary, or adenomatous structure. These tumors metastasize widely and are not infrequently detected in the axillary or cervical nodes when a biopsy is done.

The one basal-cell tumor in this series was a solitary, non-metastasizing growth and presented unusually interesting cell structures. The cells were composed of small spherical nuclei, apparently derived from the undifferentiated cells lining the bronchioles, but with a slight suggestion of prickle-cell arrangement and a tendency to form flat plates, which, although not keratinizing, spread out to form small sheets. This morphological structure lacks entirely the medullary character of the other undifferentiated tumors and occupies a unique position in this series, possessing the characteristics of limited

invasion, lack of metastases, and no capacity to differentiate.

Carcinoma of the bronchi invades the other mediastinal structures much more often than any other growth. In the present series the pericardium was invaded in seven cases, the ventricular in one, and the great vessels were infiltrated, surrounded, and narrowed in eleven.

The symptoms of bronchial carcinoma are protean in character, depending on the stage of the disease. Tumors located in the primary bronchi cause cough and often hemoptysis, those centrally located in the lung tissue may give no symptoms whatever. The first symptom may be due to metastases elsewhere in the body. The two most constant symptoms are cough and pain. There may be expectoration, at first of glairy, then mucopurulent, and finally purulent mucus. With abscess formation the sputum is foul and fetid. At first pain may be merely a vague sense of boring or oppression, but later it may be more intense, and sometimes excruciating, especially when it assumes a pleuritic character. Asthmatic breathing or dyspnea can occasionally be the first symptom. This may be caused by either replacement of a large part of the alveolar cavity by tumor tissue, or by tumor of miliary distribution, or more commonly by pleural effusion, atelectasis, or pressure by mediastinal lymph-node metastases on the trachea, bronchi, or heart. Loss of weight and strength is occasionally the first sign noticed. Osteoarthropathy was the initial sign in three cases. Fever occurred in

more than half of the patients Hemoptysis is often an early finding and often recurs

Physical signs of bronchial carcinoma are likewise protean There may be a complete absence of signs in the early stages giving way to localized bronchitis and x ray evidence of slight peribronchial infiltration in a few months Later there may be dullness, bronchial voice bronchial or diminished breath sounds and displacement of the mediastinum and diaphragm Abscess formation or pleurisy with effusion may mask the physical signs The two most helpful adjuvants are roentgenography and bronchoscopy The lesion is often situated near the opening of one of the main stem bronchi and is accessible to inspection and often to removal of a piece of the tumor for pathological examination Thoracoscopy may be of value in establishing a diagnosis and also in determining the possibility of a successful operation

Until recently the outlook for patients with carcinoma of the lung was hopeless but since the introduction of the bronchoscope a number of cases have been reported in which the growth has been removed without recurrence Lobectomy and pneumonectomy have been performed successfully Two such operations were done in this series Radiation with x rays and radium has been disappointing

The outlook for these patients is still extremely bad and the authors advise less conservatism and more operation both for diagnosis and radical extirpation

J DANIEL WILLEMS M D

Herlant M Carcinoma of the Lung in the Hospitals of Brussels (Le cancer du poumon dans les hôpitaux de Bruxelles) *Brussels med* 1937 17 800 846

From a statistical study of 303 cases of cancer of the lung which had come to autopsy in the hospitals of Brussels Herlant found that this type of carcinoma is in the increase in Belgium as well as in other countries It is not possible to explain the cause of this increase

Among these cases there were 83 males and 19 females This preponderance of males is shown also in other statistics Persons between fifty and sixty years of age are most frequently affected

In no case was there found in the patient's past history any specific pathogenetic factor but in the majority of the cases the author has been able to note the influence of chronic bronchial irritation either of an infectious or a mechanical nature

Most frequently the lesion was found to involve the upper lobes especially the lobe of the right lung and in most cases it developed in relation to a large bronchus

The author has classified carcinomatous lesions in the lung anatomically on the basis of their site of origin as follows (1) carcinomatous forms originating in relation to large bronchi which are further subdivided into hilar forms circumscribed forms lobar forms and generalized massive forms (2) carcinomatous lesions originating in relation to medium

sized bronchi, which are subdivided into cavitary forms circumscribed nodular forms diffuse forms and pleural forms (3) carcinomatous lesions which appear to originate in relation to bronchioles among which the author has observed a massive pneumonic form and a disseminated nodular form

Metastases occur by way of the lymph stream as well as the blood stream In the majority of cases the tracheobronchial and mediastinal lymph gland are involved early and the pleura the opposite lung the pericardium and the heart are involved secondarily by lymphogenic dissemination or by direct extension By way of the blood stream metastases occur most frequently in the visceral organs, especially in the liver, the kidneys the suprarenal capsules and the pancreas and also in the brain the bones and the skin

The development of a pulmonary carcinoma is responsible for the secondary lesions of irritation involving the pleura and the pulmonary parenchyma The pleural irritation manifests itself by the formation of adhesions which are more or less dense, and by the frequent formation of pachypleuritis These lesions may be also accompanied by free or encysted pleural effusions which may be serous fibrinous, hemorrhagic or purulent

In the lung two main complications may arise depending upon whether or not the neoplasm obliterates a large bronchial trunk If the bronchus is not involved the resulting complications are not of serious importance but if the bronchus is involved, the obstruction of the bronchus results in the formation of bronchiectasis or pyosclerosis in the territory above the lesion The formation of abscesses occurs frequently

Histologically the author distinguishes (1) differentiated carcinomas which are further subdivided into adenocarcinomas papilliferous carcinomas alveolar or compact carcinomas and colloid carcinomas (2) keratinized and non keratinized squamous cell epitheliomas and (3) undifferentiated small cell carcinomas These three groups according to the author occur in about equal numbers

1 Differentiated pulmonary carcinomas occur most frequently in individuals between sixty and seventy years of age They occur most frequently in women and in more than one half of the cases originate from a secondary bronchus The anatomicopathological features are those of pulmonary carcinoma in general Metastases occur by way of the lymph stream as well as by way of the blood stream In the majority of cases it seems that these carcinomas originate directly from the bronchial epithelium

2 Squamous cell epitheliomas appear most frequently in individuals between fifty and sixty years of age They occur predominantly in males The squamous cell epithelioma may present itself under its usual aspect or may assume a cavitary form or a diffuse scirrhous form at the site of old bronchiectases This type of carcinoma is frequently inclined to invade the pericardium and the heart

3 Undifferentiated carcinomas are found to occur in much younger individuals, the average age of the patients being between forty and fifty years. Males are more frequently affected than females. All these forms of carcinoma are found to originate from a main bronchus. The lesions tend to be extensive, and in this group the author has found the lobar and massive forms most frequently. The lymph glands are always involved, and especially the mediastinal glands, which may become even larger than the primary tumor. The visceral metastases are more voluminous than in other forms of pulmonary carcinoma. Histologically this type of tumor is quite characteristic. The tumor cells are small, appear elongated or round and contain very little cytoplasm. Mitoses are very frequent, the connective tissue stroma is scarce, vascularization is poor, and the areas of necrosis are very extensive. The undifferentiated character results from the very unfavorable conditions affecting the nutrition of the tissue.

RICHARD E SOMMA, M D

HEART AND PERICARDIUM

Freedman, E : Inflammatory Diverticula of the Pericardium (Encapsulated Pericardial Effusion). *Am J Roentgenol*, 1937, 37 733

Two cases of inflammatory diverticulum of the pericardium are reported by the author, with a brief résumé of the literature on the subject. This condition anatomically is a combination of pericardial scar-tissue formation with more or less marked adhesions and with a continuous slow exudate in a localized portion of the pericardium not already obliterated by scar tissue. It may be either a true diverticulum, composed of all of the layers of the pericardium, or a false diverticulum with only a serous or fibrous layer. The fluid is usually a turbid serohemorrhagic exudate. This disease is not to be confused with the congenital diverticula of the pericardium, which contains clear watery fluid. The cause of both of the author's cases was undoubtedly tubercular.

Examination of the chest in these cases by x-ray reveals either a general enlargement of the heart or a local enlargement in the region of the effusion. The diverticulum occurs most frequently on the right lower contour, but may develop in any location. The mass may follow the respiratory excursions of the heart, and it may or may not pulsate. It must be differentiated from cardiac aneurysms, aneurysm of the root of the aorta, and from mediastinal and lung tumors. The mass is either hexagonal, semicircular, or oval in shape. On inspiration the encapsulated effusion may become elongated and on expiration it may broaden out, due to the stretching and relaxing effect of the mediastinal pleura. In one of the cases reported the pericardial abscess had perforated into the subcutaneous tissues of the right anterior wall of the chest.

J E TREMAINE, M D



Fig. 1. Case 1. The left cardiac contour is normal. There is a remaining double-oval protrusion along the entire right cardiac contour, due to encapsulated pericardial effusion (E Freedman).

Behrend, M., and Boles, R. S : Indications for the Operations of Cardiolytic, Pericardiectomy, and Pericardiectomy. *J. Am M. Ass*, 1937, 108, 1947

Pericarditis is invariably a secondary process and it has no specific diagnostic symptoms. It may not be suspected because such symptoms as it might create, precordial pain, dyspnea, palpitation, and weakness, are apt to be masked by those of the primary disease.

Careful attention to physical signs affords the only reliable means of diagnosis. Even precordial pain may be absent. In the fibrinous stage a "to and fro" friction rub, when present, is diagnostic. The friction rub in this stage is evanescent, lasting only a few hours or several weeks. Effusion in the pericardial sac is demonstrated by x-ray examination. When effusion is present the x-ray examination reveals a characteristic "water bottle" shape of the cardiac shadow. Purulence of the effusion is suspected when the primary disease, such as pneumonia or empyema, chills, sweats, and rapidly developing anemia indicate the presence of a purulent process and suggest the need of early paracentesis.

Chronic adherent pericarditis is suggested by evidence of venous congestion, as demonstrated by increased venous pressure, engorgement of the cervical veins, enlargement of the liver and spleen, and ascites. According to Willius, in about 10 per cent of these cases calcification of the pericardium occurs. If extrapericardial adhesions are present also, then systolic retraction in the region of the apex or posteriorly in the eleventh and twelfth interspaces, fixation of the apex beat or of the

diaphragm and a pulsus paradoxus are usually present.

The authors report five cases of pericarditis in which they operated. The patients had been ill for long periods, and some had been discharged only to return because of the exacerbation of symptoms. One patient had tuberculous pericarditis. This patient died of miliary tuberculosis two months after pericardiectomy. The longest any one of the four patients with suppurative pericarditis survived the pericardectomy or cardiomy was two months.

The authors conclude that non surgical intervention in tuberculous pericarditis is best. They also point out the necessity of prompt radical drainage in suppurative pericarditis and earlier operation in chronic mediastinopericarditis.

EAL O LATIMER M D

ESOPHAGUS AND MEDIASTINUM

Zuppinger A. The Treatment of Carcinoma of the Esophagus (Die Behandlung der Oesophaguscarcinome). *Lehrb. d. med. Strahlenforsch.* 1930 7 389

Neither surgical nor radiological treatment has shown a noteworthy degree of cure of carcinoma of the esophagus. The result can be called a cure only if a histological diagnosis has been made which diagnosis often fails. Of the 54 cases observed by the author 7 proved negative. Carcinoma has been found most commonly between the ages of fifty-five and sixty years, after that rarely. The author believes that this finding which is contrary to other statistics is the result of the fact that older people do not come for clinical observation. The radical treatment has hastened death in some cases. The indication for treatment depends on the general state of health. Twenty-three and six tenths per cent of the author's patients were in good condition and 17 per cent were in poor condition. Treatment could be carried out in 84 per cent of the first group and only in 38 per cent of the latter. Most of the deaths occurred between the fourth and sixth months after the beginning of the treatment. The tumor was found in the upper third of the esophagus in 27 per cent of the cases, in the middle third in 46 per cent and in the lower third in 26 per cent.

The first symptom observed in 63 per cent of the cases was an obstruction to the swallowing of solid food in 17 per cent a burning or pricking sensation in 7 per cent a general tired feeling and loss of appetite and in 3 per cent hoarseness. Paralysis of

the recurrent nerve was prognostically unfavorable. Leucoplakia in the final stage was seen only twice. In 12 per cent of the cases there were metastatic tumors at the beginning of the disease. Most commonly in the lung and then in the esophagus itself. In the post-mortem examinations many metastatic tumors were found in 63 per cent of the cases. Diffuse metastases were found in 21 per cent, and glandular metastases in 30 per cent. Indications of threatening perforation of the lung were a rise in temperature and a heightened pulse with pain in the region of the tumor.

Radium treatment alone is indicated only in superficial carcinoma of the mucous membrane. Larger doses bring the danger of perforation. With proper fields sufficient roentgen irradiation can be given to the entire tumorous region always in the long axis of the body. Until 1928 full doses of roentgen rays were given in a single treatment with additional doses later but hardly any palliative results were manifest. Simple fractional irradiation of from two to four areas with 360 r each led to a decrease in the size of the tumor if the total doses amounted to more than 5000 r/s. Combined roentgen and radium irradiation is less dangerous if high roentgen doses from 9000 to 10000 r/s are used with low radium doses from 1 to 0.7 mg. In tumors that are very high up in the esophagus roentgen treatment alone is very useful in low lying tumors sufficient doses are very hard to obtain. In 12 cases local freedom from symptoms was obtained, but all of the patients died from recurrence, metastasis or heart failure. Treatment in longer intervals is deleterious as the carcinoma seems to become more resistant. Of the 105 patients treated only 3 are living free from clinical symptoms of tumor after thirty, thirty-four and thirty-nine months respectively. All of the patients who died survived a period of only six and two tenths months after the beginning of the treatment.

Gastrostomy should be done only in cases with absolute obstruction of the food passage before the irradiation and also in cases with esophagotracheal fistulas. The object of the irradiation must be to clear the passage of the esophagus as soon as possible so that the tube can be removed from the stomach. Operations for the treatment of carcinoma have been given up almost universally on account of the great primary risk. The Plummer dilatation treatment deserves trial as a palliative measure and offers valuable diagnostic possibilities.

(STEVENS) WILLIAM C. BECK M D

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Bruce, J. Massive Spontaneous Intraperitoneal Hemorrhage. *Lancet*, 1937, 232 1451

In the female the likeliest source of hemoperitoneum, occurring spontaneously, are the pelvic viscera, especially the ovaries and tubes. In the male the most common source is one of the mesenteric vessels. A systematic search for the bleeding point should be made, as ligation greatly increases the chances of survival.

Massive spontaneous intraperitoneal hemorrhage is occasionally encountered as a sequel to trauma, in malignant disease, and in ectopic gestation. Apart from such circumstances, spontaneous bleeding of serious degree is rare, especially in the abdomen.

SAMUEL KARN, M.D.

GASTRO-INTESTINAL TRACT

Segal, H. L., and Scott, W. J. M.: Changes and Results of a Decade in the Management of Gastric Ulcer. *Rev Gastroenterol*, 1937, 4 101

This review is based upon the cases of gastric ulcer admitted to the Strong Memorial and Rochester Municipal Hospitals, from January 1, 1926, to January 1, 1936. After all doubtful cases were excluded, there were 107 proved cases of gastric ulcer. In these 107 cases, 6 were found at autopsy. They had given no symptoms and were therefore considered incidental. This leaves a total of 101 cases for clinical study.

The largest number of cases occurred in the middle-aged patients, from forty to fifty-five years of age. The males outnumbered the females 65 to 1. Twenty-two had perforations, 23 major hemorrhages, and 15 marked retention of a six-hour meal. In 7 of the patients the lesions were diagnosed as benign, and later proved to be malignant, 11 were diagnosed as malignant, and subsequently proved to be benign.

Thirty-seven patients were treated surgically. These do not include the 18 patients operated upon for perforation. Thirty-four of these patients had subtotal gastrectomy of the Polya-Moynihan type, with total relief in 28, or 82 per cent, and with 4 deaths, or a mortality of 11.8 per cent. In the 23 patients operated upon by one of the authors, the operative mortality was 4.3 per cent. These figures emphasize the importance of concentrating the responsibility for gastrectomy. The general surgeon attempting only an occasional resection of the stomach will have a high mortality. A careful pre-operative and post-operative regimen will keep the operative mortality for subtotal gastric resection for ulcer to or below 5 per cent.

Thirteen of the 22 patients with perforation were operated upon with 3 deaths, a mortality of 13.3 per cent. No patient operated on within twelve

hours after the onset of the perforation died. Four patients, however, entered the hospital in shock and too late for surgery. These made a total of 7 deaths, and a total mortality for perforation of gastric lesions of 31.7 per cent.

Twenty-three patients had severe hemorrhage. Three of these continued to bleed and were operated upon with 1 death. Fifteen of the patients whose hemorrhages were controlled by medical management were not relieved of their pain, and 11 came to surgery later with 1 postoperative death. The other 10 were completely relieved of their symptoms. It is interesting to note that hemorrhage and perforation occur in about the same frequency in malignant and benign lesions.

A table is given of all cases diagnosed as benign gastric ulcer and later proved malignant. A study of the data in this table shows there was no particular symptom or syndrome which led to a more accurate diagnosis. Even occult blood was absent in a considerable proportion of these patients. The acid values proved of no aid in diagnosis.

The general routine used in determining whether a lesion was benign or malignant was a medical trial for definite improvement, as outlined repeatedly in the literature by Jordan and Lahey. "If under a definite medical regime the niche fails to disappear, or symptoms and the niche recur or increase in size, then that patient belongs to the surgeon without any further delay." The authors conclude, "Any uncomplicated lesion resembling gastric ulcer, no matter the size of the niche, is not a surgical case until this procedure has been tried. One can err either by rushing into surgery too soon or by continuing medical treatment too long. With this regime the patient is given a fair deal. Even if there are immediate reasons for instituting surgery, for economic conditions, etc., a medical regime before the operation reduces the edema and inflammation to a great extent and offers the surgeon a much better operable patient."

Another change and its result noted in this study is that although gastro-enterostomy with local excision gave no mortality in the few cases in which it was done, the morbidity was high, the total relief was low, and the recurrence of malignancy, when present, was almost certain. It is now agreed in this clinic that a subtotal gastrectomy with removal of all the glands possible is the operation of choice. The Polya-Moynihan type of gastrectomy is usually preferred. The total relief obtained from this operation was 82 per cent, and the mortality was about 5 per cent.

SAMUEL J. FOGELSON, M.D.

Ladd, W. E.: Congenital Duodenal Obstruction. *Surgery*, 1937, 1 878

The obstetrician and pediatrician should regard vomiting of the newborn infant as a symptom de-

diaphragm and a pulsus paradoxus are usually present

The authors report five cases of pericarditis in which they operated. The patients had been ill for long periods and some had been discharged only to return because of the exacerbation of symptoms. One patient had tuberculous pericarditis. This patient died of miliary tuberculosis two months after pericardiotomy. The longest any one of the four patients with suppurative pericarditis survived the pericardectomy or cardiolysis was two months.

The authors conclude that non surgical intervention in tuberculous pericarditis is best. They also point out the necessity of prompt radical drainage in suppurative pericarditis and earlier operation in chronic mediastinopericarditis.

EARL O. LATIMER, M.D.

ESOPHAGUS AND MEDIASTINUM

Zupplinger, A. The Treatment of Carcinoma of the Esophagus (Die Behandlung der Oesophagus carcinome). *Ergebn. d. med. Strahlenforsch.* 1936 7 339.

Neither surgical nor radiological treatment has shown a noteworthy degree of cure of carcinoma of the esophagus. The result can be called a cure only if a histological diagnosis has been made which diagnosis often fails. Of the 54 cases observed by the author 7 proved negative. Carcinoma has been found most commonly between the ages of fifty five and sixty years after that rarely. The author believes that this finding which is contrary to other statistics is the result of the fact that older people do not come for clinical observation. The radical treatment has hastened death in some cases. The indication for treatment depends on the general state of the health. Twenty three and six tenths per cent of the author's patients were in good condition and 17.7 per cent were in poor condition. Treatment could be carried out in 84 per cent of the first group and only in 38.5 per cent of the latter. Most of the deaths occurred between the fourth and sixth months after the beginning of the treatment. The tumor was found in the upper third of the esophagus in 27.7 per cent of the cases, in the middle third in 46.2 per cent and in the lower third in 26.7 per cent.

The first symptom observed in 63.5 per cent of the cases was an obstruction to the swallowing of solid food, in 17.4 per cent a burning or pricking sensation, in 7 per cent a general tired feeling and loss of appetite and in 3 per cent hoarseness. Paralysis of

the recurrent nerve was prognostically unfavorable. Leucoplakia in the final stage was seen only twice. In 12.8 per cent of the cases there were metastatic tumors at the beginning of the disease, most commonly in the lung and then in the esophagus itself. In the post mortem examinations many more metastatic tumors were found: in 63 per cent of the cases diffuse metastases were found in 21 per cent and glandular metastases in 30 per cent. Indications of threatening perforation of the lung were a rise in temperature and a heightened pulse with pain in the region of the tumor.

Radium treatment alone is indicated only in superficial carcinoma of the mucous membrane. Larger doses bring the danger of perforation. With proper fields sufficient roentgen irradiation can be given to the entire tumorous region always in the long axis of the body. Until 1928 full doses of roentgen rays were given in a single treatment with additional doses later but hardly any palliative results were manifest. Simple fractional irradiation of from two to four areas with 360 r each led to a decrease in the size of the tumor if the total doses amounted to more than 5,000 r/t. Combined roentgen and radium irradiation is less dangerous if high roentgen doses from 8,000 to 10,000 r/t are used with low radium doses from 1 to 0.7 med. In tumors that are very high up in the esophagus roentgen treatment alone is very useful. In low lying tumors sufficient doses are very hard to obtain. In 12 cases local freedom from symptoms was obtained but all of the patients died from recurrence, metastasis or heart failure. Treatment in longer intervals is deleterious as the carcinoma seems to become more resistant. Of the 105 patients treated only 3 are living free from clinical symptoms of tumor after thirty, thirty four and thirty nine months respectively. All of the patients who died survived a period of only six and two tenths months after the beginning of the treatment.

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(STEVENS) WILLIAM C. BECK, M.D.

The authors analyzed their series very carefully as to the predisposing and exciting factors of the conditions. An analytical study was made of the bacteriology, pathology, symptomatology, and treatment. In view of the mortality rate reported it is interesting to note that "it has been the rule in the authors' clinic to operate immediately after the diagnosis of acute appendicitis has been made regardless of the duration of the symptoms unless the patient is practically moribund."

The McBurney incision was used in 70 per cent of the cases and is now favored by the authors as a routine procedure. Unless specifically contra-indicated, spinal anesthesia is used. The use of the McBurney incision and spinal anesthesia, together with careful pre-operative and postoperative treatment, in the opinion of the authors, account for the declining death rate from perforated appendicitis.

EARL GARSIDE, M D

Abel, A. L.: Common Diseases of the Rectum and Anal Canal. *Brit M. J.*, 1937, 1: 1297

Abel reviews the anatomy of the rectum, describes the proper technique of examination, and discusses the more common diseases encountered: fissure, piles, abscess, fistula, pruritus, and tumors.

SAMUEL KAHN, M D

Leibovici, R.: Hysterectomy and Colpectomy in the Radical Removal of Cancer of the Rectum (Place et rôle de l'hystérectomie et de la colpectomie dans l'extérèse large du cancer du rectum). *J de chir.*, 1937, 49: 665

At a time when radical removal of cancer of the rectum was considered a very dangerous operation, Tixier proposed hysterectomy as a routine supplementary operation.

The author believes that supravaginal hysterectomy is a valuable supplementary operation in excision of cancer of the rectum because it gives a better view of the floor of the pelvis on which the operation is being performed, it provides material for peritonization, and the vagina, opened at the top by the operation, provides excellent drainage. Some have advocated colpectomy also, and slit the posterior wall of the vagina, but the author believes this method is dangerous because of the prolapse of the bladder which follows it.

The author performs an abdominoperineal amputation of the rectum, which has been described in previous articles. In this article he deals only with the hysterectomy and the technique by which the pelvic field of operation is hermetically closed off from the peritoneal cavity. The steps of this part of the operation are illustrated. It is not necessary to carry vesicovaginal dissection very far or to open the broad ligaments freely to isolate the ureters. A high and easy sub-total hysterectomy is sufficient. The pedicles of the utero-ovarian vessels and round ligaments should be kept long, and as much as possible of the vesico-uterine peritoneum and broad ligaments should be preserved. The sutures which

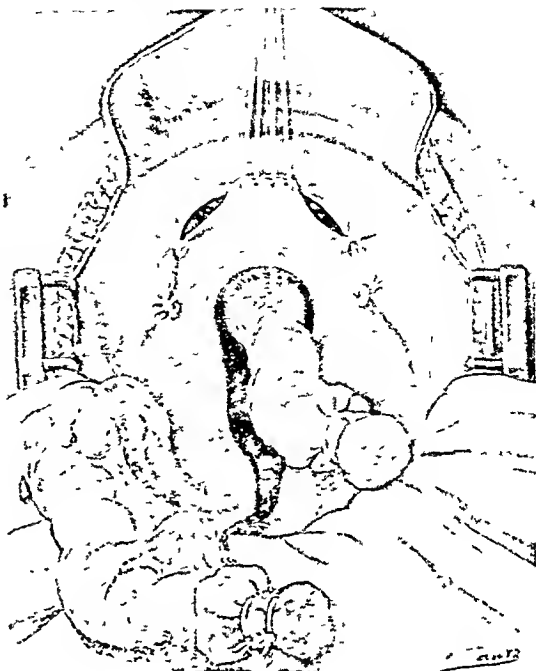


Fig 1.

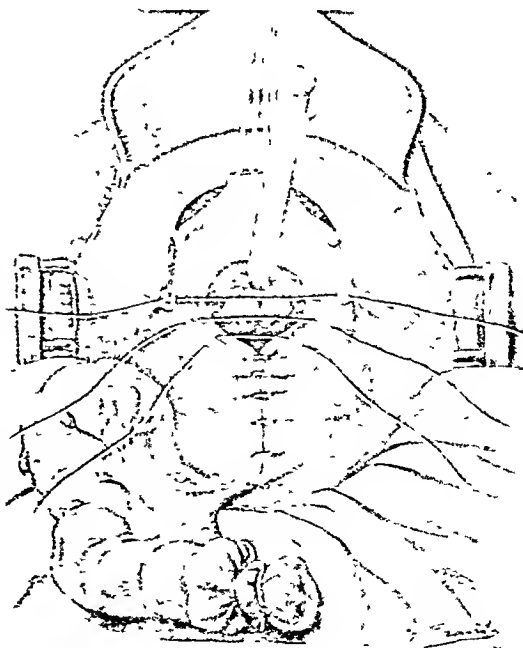


Fig 2

manding investigation of the alimentary tract. Many infants may thus be given a chance for life which was formerly denied them.

Posterior duodenojejunostomy is the operation which has proved most successful in relieving intrinsic duodenal obstruction. Of the other types of operations used the one that seems most logical is the plastic operation on the duodenum described by Morton.

For the extrinsic type of duodenal obstruction the transposing operation described by the author is the one of choice. The reduction of the volvulus alone is not sufficient to relieve permanently the obstruction of the duodenum due to malrotation of the midgut.

SAMUEL KAHN, M.D.

McGehee J. L. and Anderson W. D. Chronic Obstruction and Dilatation of the Duodenum. *Ann Surg* 1937 105 741.

The authors report a case of chronic obstruction and dilatation of the duodenum in a female eighteen years of age. At the operation they found that the duodenum was distended to the part crossed by the superior mesenteric artery. They relieved the obstruction by a duodenojejunostomy.

SAMUEL PERLOW, M.D.

Hogan E. P. The Appendix Problem. *Ann Surg* 1937 105 813.

There were 18,120 deaths from appendicitis in the United States during 1934 while the deaths between 1900 and 1934 have never mounted higher than 13.3 per 100,000 population.

Appendicitis is a neglected medical educational problem. The subject of appendicitis does not even appear in many recent authoritative treatises on gastroenterology and the practice of medicine.

Hogan traces the surgeon's experience with appendicitis from the time appendicitis was recognized as an entity and recounts the varying trends of opinions concerning its treatment. As more experience has been gained the mortality has decreased. Hogan urges now that the public be educated regarding this condition as he believes that thereby further reduction of the mortality rate can be accomplished. It is well established that early diagnosis is the key note of treatment and the patient's knowledge of the disease will do much to make a clinical history more accurate.

The author then outlines the procedure required to establish a diagnosis of appendicitis. He reviews the signs and symptoms that have come to be associated with the disease and emphasizes the more important ones.

He states that the type of treatment employed has a definite bearing upon the mortality. Various surgeons have somewhat different views on the subject of treatment and he reviews the opinions of many outstanding surgeons and refers to the large series of cases reported by them. He believes that the intensive study being made of appendicitis accounts for the reduction of the mortality as shown

by the records of official statisticians. More than 90 per cent of the mortality reported is due to some form of peritonitis.

The author then concludes with the statement that a broad educational campaign national in scope will decrease the number of cases of appendicitis which come under observation after inflammation has extended beyond the appendix.

EARL GARSIDE, M.D.

Bullowa J. G. M., McCabe E. J. and Wishik S. M. Acute Appendicitis in the Exanthems. *Am J Dis Child* 1937 53 1029.

Because abdominal pain and vomiting are frequent early symptoms of the exanthems, appendicitis is overlooked occasionally in the early stages of those conditions. On the other hand, children are operated on frequently in the prodromal stages of the various exanthems for conditions which turn out to be pseudo-appendicitis. The differentiation between pseudo-appendicitis and true appendicitis is difficult. The authors offer no method for differentiation but state that true appendicitis is extremely rare in the prodromal stage of the exanthems and that when there is a history of exposure to disease as measles, right lower quadrant pain may be due to pseudo-appendicitis unless the findings are overwhelmingly those of a condition requiring surgery. They believe that a specific gut-cell reaction of the exanthem can occur in the appendix and give pseudo-appendical symptoms. They report 21 cases of definite appendicitis which were operated in 26,461 patients with contagious diseases.

SAMUEL PERLOW, M.D.

McClure R. D. and Altemeier W. A. Acute Perforated Appendicitis with Peritonitis. *Ann Surg* 1937 105 800.

McClure and Altemeier studied 231 consecutive cases of acute perforated appendicitis which were treated at Henry Ford Hospital during the period from 1915 to 1933 with special reference to the mortality rate. In 22.1 per cent of the patients admitted with acute appendicitis perforation had occurred. The cases were divided into 4 groups.

Group A. Cases with perforation of the appendix and local peritonitis. These made up 21.83 per cent of all the cases and showed no mortality.

Group B. Cases with perforation of the appendix and abscess formation. This group made up 46.43 per cent of all the cases and showed a mortality of 4.2 per cent.

Group C. Cases with perforation of the appendix and general peritonitis. These amounted to 25.70 per cent of all the cases and showed a mortality of 21.5 per cent.

Group D. Cases with perforation of the appendix, general peritonitis and abscess. The mortality in this group was 46.6 per cent.

During the nineteen year period from 1915 to 1933 the operative mortality decreased from 22 to 7.7 per cent.

Tucker and Hellwig base their conclusions on the clinical and histological study of 43 cases of anal pruritus occurring among 386 patients. The incidence was 11 per cent. There were 22 men and 21 women. No children were observed with true pruritus. The great majority of the patients presented one or more lesions of the anal canal. Histological studies revealed that the pathological picture of the anal canal of a patient with pruritus did not differ from that of patients without pruritus. Therefore anal lesions cannot be regarded as the essential cause of this disease. Radical removal of all anal lesions will often markedly improve the pruritus but will seldom bring about a complete cure of the trouble.

From the histological studies of the cutaneous changes in pruritus, the picture compared favorably with that of a chemical dermatitis. Hydrops of the epidermis cells, irregular proliferation of the stratum mucosum and of the hair follicles, hyperkeratosis with plugging of the hair follicles, and atrophy of the sebaceous glands are changes characteristic of dermatitis due to chemical irritants. The four stages seen in pruritus, i.e., (1) exudative inflammation, (2) epidermoid proliferation, (3) atrophy of the epidermis and sebaceous glands, and (4) epithelial defects, can be produced in the skin of rabbits and mice by the action of certain chemical substances which may be present in human feces. Besides other hydrocarbons, scatol may be the responsible agent in this malady.

JOHN W. NUTTM, M.D.

LIVER, GALL BLADDER, PANCREAS, AND SPLEEN

Heuer, G. J.: The Surgical Aspects of Acute Cholecystitis. *Ann Surg*, 1937, 105 758

The author believes that the literature regarding the surgical aspects of acute cholecystitis gives the impression that the clarification of certain matters often referred to might aid in determining the comparative value of early and late surgical treatment. He raises the following questions:

1. Has not the relationship between the clinical symptoms of acute cholecystitis and the pathological course of the inflammatory process in the gall bladder an important bearing upon the question of early or late operation?

2. Does the acutely inflamed gall bladder so rarely undergo gangrene and perforation that these complications may be disregarded as important factors in the treatment of the disease?

3. Do the complications of gangrene and perforation of the gall bladder contribute so little to the mortality in disease of the gall bladder and bile ducts that they may be disregarded in a plan of treatment of the disease?

4. Is the danger to the patient of operating in the acute stage of the disease before gangrene and per-

foration have occurred greater than the danger of gangrene and perforation, the result of a conservative or waiting policy?

In an effort to find an answer to these questions the author includes studies made of 1,565 cases and, in addition, over 35,000 cases of disease of the gall bladder and bile ducts gathered from more recent literature, as well as some 1,500 cases of acute cholecystitis specifically. In this article, he states the conclusions at which he arrived with respect to the questions which he propounded.

He states that the clinical symptoms, physical signs, and laboratory data in acute cholecystitis often fail to indicate accurately the course of the pathological process in the gall bladder. In the acutely progressive type of the disease, the clinical manifestations fairly closely parallel the pathological process in the gall bladder, but in other cases, even in the presence of subsiding or minimal symptoms, the pathological process in the gall bladder may proceed to gangrene and perforation of the organ. It appears that gangrene and perforation occur approximately in 20 per cent of all cases of acute cholecystitis, the pathological course of which is not interrupted by surgical measures. It appears further that these complications are responsible, under a deferred plan of treatment, for a mortality in acute cholecystitis which varies greatly among different observers, but which in the literature is rarely below 20 per cent and often as high as 40 per cent. This mortality represents approximately 10 per cent of the total mortality in the surgical treatment of non-cancerous disease of the gall bladder and bile ducts.

The incidence of gangrene and perforation and the mortality are sufficiently high not to be disregarded in a plan of treatment of this disease, unless it be true that they are less a menace to the life of the individual with acute cholecystitis than operation performed early for the purpose of avoiding them. That these conditions are not less dangerous but distinctly more dangerous than operation in the acute stage of the disease is suggested by an experience derived from a study of 153 cases of acute cholecystitis in which operation in the acute stage was deliberately planned and, so far as possible, consistently carried out with the purpose of attempting to lower the mortality from gangrene and perforation of the gall bladder. In this series, the total mortality was 3.2 per cent, but when analyzed from the viewpoint of the extent of the disease, the mortality in 137 cases in which cholecystectomy was performed before perforation occurred was 2.1 per cent. The mortality in 16 cases subjected to operation after perforation had occurred was 12.5 per cent. This mortality is so favorable in comparison with the published statistics of mortality rates following the surgical treatment of cholecystitis that the author feels justified in continuing a method of treatment which is opposed to the conservative method.

EMIL C. ROBITSHEK, M.D.

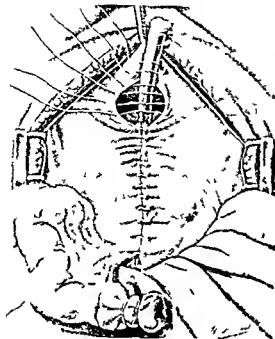


Fig 3

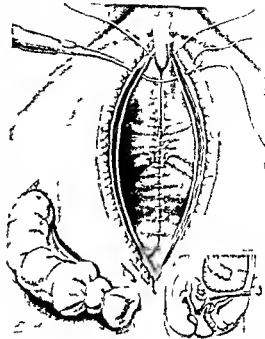


Fig 4

close the cervix are not cut for they can be used for traction to lift up and open the Douglas pouch. This is shown in Figure 1 which illustrates the stage of the operation after the hysterectomy has been performed. The superior hemorrhoidal and the mesocolon have been sectioned the rectum freed and the colon sectioned near the rectosigmoid juncture. Figure 2 shows the beginning of peritonization which the author carries out by the method proposed by Coffey. Peritonization is the most important part of the abdominal operation and the success of the operation depends on the care with which it is performed. The field of operation must be closed off absolutely hermetically from the peritoneal cavity. The pelvic peritoneal floor is restored by a sagittal suture passing from the promontory to the pubis. Although the bottom of the pelvis is excluded it is drained abdominally by a chimney or tube made around the drain with bladder peritoneum the course of which is entirely extraperitoneal. The pedicles of the broad ligaments are brought together in the midline and sutured. Figure 3 shows the continuation of this median sagittal peritonization above the cervix and the bladder. It shows the serous chimney for the drain made of the thick and mobile bladder peritoneum which has been made still more mobile by the removal of Doyen's valve. Figure 4 shows the completion of the peritonization with the extra peritoneal drainage chimney emptying above the pubis. The hermetic closing-off of the field of

operation is complete. The colon comes out through an iliac counter opening. The excess will be resected and an iliac anus established by the use of a Pauls tube.

The perineal stage of the amputation is performed as usual. After the rectum is removed the pelvic peritoneal floor is supported by a large Mikulicz drain and the perineal wound left open. A retention catheter should be inserted to keep the bladder empty and protect the peritonization.

AUDREY GOSS MORGAN M D

Tucker C G and Hellwig, C A. Pruritus Ani. Histological Picture in Forty Three Cases. *Arch Surg* 1937 34 97.

Pruritus ani may be regarded as a disease that is very poorly understood. The cause is generally disputed and the variety of proposed remedies offered for treatment suggests that nothing has been found resembling a cure. There are two types of pruritus the direct and the indirect. In the direct type of pruritus local anal diseases such as fistulas fissures ulceration of the anus and rectum polyps papillae and hemorrhoids have all been given as causes. In the indirect type Montague regards the intense itching as a referred symptom caused by disorders in distant organs. Bacteria and lungi pediculi and pin worms are mentioned frequently as factors. In certain cases the condition has been attributed to allergy. It may be said truthfully that the cause of this distressing condition is not known.

irradiation therapy. Radium may be employed by means of vaginal or intra-abdominal application. The latter mode entails great risks both as to primary mortality and late complications from fistula. Telecurietherapy is available only in large centers possessing large amounts of radium. Roentgenotherapy is the treatment of choice when radium cannot be applied directly to the lesion.

The results of treatment are encouraging enough to warrant persistent efforts. Cures have been obtained. More will follow as the methods are improved. When properly carried out, the treatment of even hopeless cases will do much to ease the course of the disease. HAROLD C. MACK, M.D.

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The management of the severe pain which characterizes the late stages of cervical cancer presents a real problem. Morphine, even in large doses, is permissible. Its disadvantages are obvious: (1) it calms the patient but weakens her, (2) its constant administration is costly, and (3) the patient suffers more or less between injections.

Cobra venom administered subcutaneously at from eight to ten day intervals has been successful occasionally. The results with this method are not consistent enough to merit serious consideration.

Surgical procedures are more efficacious and are worthy of consideration. These operations are designed to interrupt the paths by which the pain sensations are carried to the cerebrum. The author lists two chief paths: (1) from the inferior hypogastric plexus or Frankenhauser's plexus, to the hypogastric nerves, to the presacral nerve or the superior hypogastric plexus, where they combine with the fibers to the mesenteric plexus and the lumbar sympathetic ganglions, and (2) from the periarterial plexus of the uterine arteries to the hypogastrics to end in the lumbar sympathetic ganglions.

Pain may be caused by one of several possible factors: (1) involvement of the pelvic sympathetics; (2) benign or malignant periarterial lymphangitis; (3) neuritis of the presacral nerve, (4) inflammatory changes of the sacral plexus, (5) distention of the ureters, kidney pelves, or kidneys, and (6) sacral or lumbar metastases. This multiplicity of factors accounts for the many different surgical approaches which have been devised, and also explains both their successes and failures.

The author lists the following surgical procedures which have been attempted:

1. Section of the posterior roots of the lumbar nerves. This procedure requires an extensive laminectomy, gives inconstant results, and has therefore been abandoned.

2. Section and resection of the sympathetics, hypogastric periarterial sympathectomy, and sympathectomy of the superior hypogastric plexus. This method succeeds in about one-third of the cases, in

one-fourth it failed entirely. The technique is simple if the lesion is not too advanced to permit surgical approach. Rectal and vesical symptoms resulting from disturbed innervation are not serious.

3. Complete or partial cordotomy. The complete section of the cord is no longer performed. It was applied only to those patients who were already paraplegic and incontinent. Partial cordotomy may be either unilateral or bilateral. It involves cutting the anterolateral portion of the cord in the region of the fifth lumbar segment. This operation has a mortality of from 5 to 7 per cent. The results generally are good. Loss of sensation is complete. Transient paralysis of the lower extremities, urinary retention, and constipation are observed for a period of from three to four weeks in 30 per cent of the cases.

Recent attempts to destroy pain paths by means of alcohol by infiltration of the sacral nerve roots or by subarachnoid injections have been reported with very favorable results. Failures resulted in only 10 per cent of the cases. Transient paralysis, urinary retention and incontinence, and diarrhea have been noted as sequelae.

The author recommends more earnest consideration of these methods for the relief of pain in patients with cancer. No one method, he cautions, is suitable for all cases. Alcohol injection into the subarachnoid space is the most simple method of all. It can be performed without jeopardizing the patient's life. In event of failure, resection of the superior hypogastric plexus, of all surgical methods, promises the maximum of relief with the minimum of risk. If the pain is sacral or renal in origin, cordotomy or section of the posterior commissure of the cord may be attempted. In all such attempts the operator has much to gain and little to lose, the results are often gratifying.

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Invasion of the glands is of primary importance in the prognosis and treatment of cancer of the uterus. Still very little is known about it. It is not known definitely in which forms of uterine cancer the glands are most apt to be involved, at what time they become involved, to what extent irradiation affects them, and how much surgical removal of the glands increases the chances of cure. Different authors give the percentage of cancer of the cervix in which the glands are involved at from 15 to 75 per cent.

If the glands are involved and are not removed, there is almost certain to be a recurrence. Estimating that adenopathy exists in a third of the patients, the author thinks it preferable to subject the other two-thirds to gland removal rather than let one-third run the risk, or the almost certainty, of gland recurrence. It is not yet known definitely even what

GYNECOLOGY

UTERUS

Lefebvre C. and Gouzi J. Cancer of the Cervical Stump (Le cancer du col restant) *Rev franç de gynec et obstet* 1917 37 256

The entire problem of carcinoma of the cervical stump resolves about a single question: Does the frequency of this form of cancer demand the routine adoption of total rather than sub total hysterectomy? If total hysterectomy were as simple a procedure as the sub total operation there would be no reason to discuss the matter. Cancer of the cervical stump would automatically be eliminated. If also, the incidence of carcinoma of the stump and its gravity surpassed the dangers of the total operation there would be no reason for discussion. The total operation would then be the only choice. For the majority of surgeons total hysterectomy is a formidable procedure. Moreover there is no universal agreement that carcinoma of the cervical stump is extremely frequent.

With these remarks the authors introduce their discussion of carcinoma of the cervical stump which they treat from the standpoint of incidence, cause, pathology, clinical aspects and therapy.

Reports as to its incidence are highly variable. The number of published cases is steadily increasing. Statistics of cancer institutions must be viewed critically however since they do not and cannot give the important information as to the frequency of this form of cancer in large series of sub total hysterectomies. The authors calculate an incidence of 0.5 per cent in a series of 22 165 hysterectomies. Dor and Mevel comparing the frequency of the sub total operation and the finding of cancer of the cervical stump in two different hospitals over a given period calculate an incidence of 0.65 and 1.5 per cent respectively. Careful follow up studies of their cases by individual surgeons will alone give the answer. This study promises great difficulty since not more than 30 per cent of the patients will return for long continued observations.

According to the authors 30 to 40 per cent of cancers of the stump are early and more than one third were present at the time of operation. An interval of one year after the operation justifies the assumption that the cancer developed in the stump even though the delay in the clinical appearance does not rule out the possibility that the neoplasm already existed before the operation. The majority of carcinomas of the stump appear less than six months and more than two years after the operation.

Myomas of the uterus are not as some suppose the common preceding lesion. Salpingitis is equally frequent. In late cases salpingitis even predominates as a possible predisposing factor. The pathogenesis of this form of cancer like that of others is obscure. No clinical features are helpful in deter-

mining the cause nor do histological studies indicate a point of origin.

The best prophylaxis lies in perfecting our diagnostic facilities. Total hysterectomy performed routinely is too radical since the mortality surpasses the incidence and mortality of cancer of the stump itself. It should be reserved for suspicious cases. Cancer of the stump should be treated by irradiation only, operation is at best incomplete and difficult. The prognosis in general is poor.

HAROLD C. MACE, M.D.

Dienlaffé R. Local and Regional Recurrences of Cervical Cancer (Les récidives loco régionales dans le cancer du col) *Rev franç de gynec et obstet* 1937, 37 2 3

There is a general tendency to regard recurrences of cancer with great pessimism. Another unfortunate tendency, says the author is to overlook the fact that a recurrence does not differ essentially from the primary tumor. A recurrence, therefore, is merely a continuation of the original tumor and is not necessarily more malignant. It means almost always that the primary tumor has been treated insufficiently.

The author describes two ways in which neoplasms may recur: (1) as a regional recurrence or recurrence *in situ* and (2) as metastasis or recurrence at a distant point. The former variety may present itself locally in the vaginal scar or in the uterus in the pelvis by direct extension or via the lymphatics or in the lymph glands which drain the cervix.

Recurrences present an important and frequent clinical problem. They are more frequent in the aged and in those in poor general health. The large ulcerative and vegetative growths recur more frequently than the nodular varieties. Opinions vary as to the tendencies toward recurrence of the different histological cancer types. Recurrences are equally frequent after radical surgery or irradiation therapy in advanced cases. Recurrences *in situ* are frequent after surgery, pelvic or lymph gland recurrences most commonly follow vaginal and uterine applications of radium.

Recurrences are most frequent during the first year or two after treatment; those following radium treatment are observed later than those following surgery. Recurrences after five years are rare.

The author discusses the common signs and symptoms of recurrences. In cases in which it is difficult to distinguish between recurrence and supervening inflammatory processes, biopsy or exploratory laparotomy are indicated.

An efficient prophylaxis against recurrence after any form of treatment has not as yet been devised.

The treatment of recurrences by surgical means is difficult and has now been superseded largely by

irradiation therapy. Radium may be employed by means of vaginal or intra-abdominal application. The latter mode entails great risks both as to primary mortality and late complications from fistula. Telecurietherapy is available only in large centers possessing large amounts of radium. Roentgentherapy is the treatment of choice when radium cannot be applied directly to the lesion.

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glands are involved in cancer of the cervix. This would seem to be a very simple anatomical question but authorities are still divided on it. It seems possible that a migrating cancer cell may reach the glands of the internal and middle chains of the external iliac group, the glands of the hypogastric group, and the glands of the primary iliac group, glands of the promontory. There seems to be a semicircle of lymphatic glands open forward where it extends to the upper border of the obturator foramen.

In the history of treatment of cancer of the cervix two tendencies have been revealed: first to remove all of the glands freely and then to remove the cellular tissue but leave the glands. More recently there has been a tendency toward a more limited removal. Leveuf recommends treating the cervix with radium first and a month later removing the glands after laparotomy, sectioning the lymph gland layer of the uterus after having dissected it which necessitates section of the umbilico uterine trunk. Brocq, Palmer and Parat resect the external iliac vein in order to resect the large affected glands. While this operation is not serious it involves some edema of the malleoli.

The figures for the late results of gland removal are as varied as those for the involvement of the glands. Both the operative indications and the results of operation are still more or less matters of speculation.

The author recommends a simple technique for exploration of the glands. An incision as for ligation of the external iliac should be made and slightly enlarged by section of the epigastric vessels; the incision is followed by subperitoneal dissection and finding of the external iliac vessel packet. The dissection is extended inward and downward to expose the obturator nerve and upward to come as near as possible to the bifurcation of the common iliac artery. Exploration of the lymphatic glands along the external iliac vein and all around it should be carefully made, particularly of the space bounded above by the vein and below by the obturator nerve. A very large gland which Leveuf calls the principal gland is usually found in the latter location. The glands should be removed, the vessels ligated and the subperitoneal space drained to prevent hematoma, lymphorrhagia or infection. The best time for this operation seems to be from six weeks to two months after the end of the physical treatment. At this time inflammatory adenopathies have doubtless disappeared. The absence of inflammation is very important in judging the real condition of the gland and also to avoid infecting the subperitoneal tissue upon opening the lymphatics. Vaccination is recommended before operation.

Observations which are made in this way will give a fuller knowledge of the amount of gland involvement and will make it easier to judge the value of removal of the gland in preventing recurrence of cancer of the cervix.

ADNEAL AND PERIUTERINE CONDITIONS

Pierra L. M. Heliotherapy in Gynecology. Its Place in the Treatment of Non-Tuberculous Inflammations of the Adnexa. (*L'héliothérapie en gynécologie sa place dans le traitement des inflammations annexielles non tuberculeuses*). *Revue française de gynécologie et d'obstétrique* 1937 32: 157.

Heliotherapy has been used extensively in tuberculosis but very little in other affections. Many physicians do not know anything about it, and others believe that it can be used only in special sanatoria and in special locations such as the high mountains or the seashore. This is a mistake. It can be used anywhere where there is sunshine.

The author was first led to the use of heliotherapy during the war in which he found it valuable not only for tuberculosis but also for war wounds, particularly bone wounds. After having found it very effective in orchitis epididymitis he began using it in inflammations of the tubes and ovaries. He was working in the Vosges region which cannot compare for sunlight with the French or Italian Riviera and he did not have any special sanatorium but had to utilize the conditions which he found around him. It was not until 1925 that he was able to build a solarium.

Strict rules have to be followed in this sunshine treatment. The sunshine should be direct that is it should act on the nude body without even any light transparent covering. It should act on the whole body except the head and shoulders. It should be given in the fresh air and preferably immediately after the bath. The temperature should be kept at from 30° to 40° although the treatment may be effective at lower temperatures and some patients can bear it as high as 50°. In most sanatoria the patients lie flat on their backs in bed, but the author prefers to elevate the head of the bed so that they lie on an inclined plane. The exposure should be progressive in surface and duration. However the author does not agree with Koller as to the efficacy of sunburn. He does not find that the erythema is an active factor in the results but rather that it is a defense reaction. He finds it best to expose the patients to the sunshine until they have had a sunburn for some time, from fifteen to thirty days and then let them rest for from eight to fifteen days until the pigmentation disappears.

This treatment should be used only in cases of chronic adnexitis after the fever and acute inflammation have subsided. The author has treated about 800 patients in this way from 1919 to 1936. In almost all of them the pain stopped very quickly. The sunshine had a hemostatic or rather a eumenorrhetic effect that is it tended to establish the normal equilibrium of the menses no matter whether they were too scanty or too profuse. Only occasionally was there a transitory rise of fever during the treatment. This statement leaves out of account the slight fever of from 37.5° to 38° which sometimes occurs in the beginning of the treatment just as fever may occur in the beginning of diathermy, but

which is not sufficient to require cessation of the treatment

The proportion of cures or improvements compares very favorably with that of other non-surgical methods of treatment. In about three-fourths of the cases (72 per cent) the sunshine treatment gave satisfactory, or very encouraging, results

The objection may be made that most of the patients were given some other form of treatment also, such as vaccine therapy or diathermy. However, that is no reason for not utilizing these different methods of treatment, all helpful, which save many women with chronic inflammation of the uterus and tubes from mutilating operations, heliotherapy is a very valuable adjuvant in such non-surgical treatment.

AUDREY GOSS MORGAN, M D

Sampson, J. A : The Lymphatics of the Mucosa of the Fimbriæ of the Fallopian Tube. *Am J Obst & Gynec*, 1937, 33 911

From the study of carcinoma-filled and empty lymphatics in the mucosa of the ampulla of the human fallopian tube, the author believes that the distribution of these vessels closely resembles the distribution of the lymphatics in the mucosa of the ampulla of the sow's tube described by Andersen

Since the fimbrial mucosa has the same histological structure as the mucosa of the distal portion of the ampulla with which it is continuous, it might be inferred that the distribution of the lymphatics in the mucosa in these two locations would be the same. By comparing the lymph vessels in mucosal folds of approximately the same size and shape in one or several sections of both the ampullar and fimbrial mucosa, it is possible, in a general way, to visualize the distribution of the lymphatics in that type of mucosal fold. As mucosal folds vary in size and form, the pattern of the lymphatics in these folds must vary accordingly. The larger folds with secondary folds arising from them will have a more complex lymphatic pattern than the smaller and simpler folds

For descriptive purposes the lymphatics of the ampullar and fimbrial mucosa may be divided into two plexuses: one situated in the mucosa at the base of and between the folds, and the other in the folds. Vessels from the plexus in the folds empty into the plexus at the base of the folds. Thus, the lymphatics of one mucosal fold are united with those of adjacent folds. This pattern prevails in all sizes and types of mucosal folds, whether in the ampulla or fimbriæ

The author has been unable to ascertain either the pattern of the branching and anastomosing of the lymph capillaries in the folds or the form of their termination, really their origin, in the crest of the folds, whether it occurs in blind ends or loops. Only by a careful study of tubes in which the lymphatics have been injected can these finer and interesting details be determined.

In the sections of the fimbriæ studied, the lymph vessels of the mucosa were usually more dilated and

therefore more easily seen than the vessels in the ampullar mucosa of the same tube. In spite of this fact, the author experienced almost as much difficulty in tracing, even in serial sections, these non-injected capillaries in the fimbrial folds as those in the ampullar folds. Since the lymphatics of the ampullar and fimbrial mucosa are true capillaries without valves, a free circulation of the lymph in all directions in the plexuses is assured

There is abundant evidence that the lymphatics at the base of and between the mucosal folds of the fimbriæ about the ostium of the tube are continuous with similar lymphatics of the mucosa of the distal portion of the ampulla. There are indications that the mucosal lymphatics of the fimbriæ drain into vessels in the wall of the infundibulum and also in the mesosalpinx beneath this mucosa

An anastomosis between lymph vessels, coming from the hilum of the tubal pole of the ovary, and the lymphatics of the adjacent ovarian fimbriæ may exist, but was not positively demonstrated. No suggestion was found of an anastomosis between the mucosal lymphatics of the fimbriæ and the subserosal lymphatics at the mucoserosal junction.

EDWARD L CORNELL, M D.

EXTERNAL GENITALIA

Gerhardt, Leopold: Rare Tumors of the Vulva (Seltene Geschwulste der Vulva) *Ginek polska*, 1936, 15 936

The author gives a description of three rare tumors of the vulva. The first case was that of a girl of nineteen years. The tumor originated in the large labium pudendi, and in less than three months, it grew to immense proportions. During all this time, the patient felt no appreciable pains except those due to its size and location. The tumor became as large as the head of an adult, and it had an uneven surface. In the flexure of the right groin, it extended to the inguinal glands. At this site there was a collection of glands the size of an orange. Simultaneously with this new growth, menstruation ceased. In the opinion of the author, the tumor has a retarding influence upon the function of the ovaries. The clinical diagnosis was primary sarcoma of the vulva. The histological investigation revealed endothelioma and perithelioma of the vulva. The therapy consisted of three successive x-ray exposures. In connection with the irradiation, it was noticed that the tumor was spreading into the soft parts of the right buttock and that the general condition was becoming worse. According to Kehrer, there could be found records of only 75 similar cases in the literature of which number, however, only 9 are described as true endothelioma

The second case was that of a woman forty-two years old who had an acromegalic type of tumor. The patient noticed in the large labium pudendi, a nodule the size of a lentil, which in the course of three and one-half years increased to about the

size of a hen's egg. The tumor was distinguished by a deep blue color; it adhered to the surface skin and presented only an indistinct delimitation from its surroundings. Clinical diagnosis disclosed primary melanosarcoma of the vulva and histological examination confirmed the clinical diagnosis. Since the patient refused her consent to a radical operation all that could be attempted was the extirpation of the nodule. In the course of two months metastases appeared in the bordering glands. X-ray therapy was also refused by the patient. After a period of six months death occurred. Including this case, the literature contains a record of only 89 cases of melanosarcoma of the vulva.

The third case was that of a patient thirty-four years old who a year previously had noticed on her outer genitals a nodule which had been growing steadily. The gynecological examination revealed a tumor on the right large labium pudendi the size of a fist of hard consistency and uneven surface. The tumor was stationary. The histological examination revealed an inflamed fibromyoma. Removal was accomplished by operation. In the literature 19 similar cases were found.

(B. KOWALSKI) CLARENCE C. REED, M.D.

MISCELLANEOUS

Bickanbach, W. Radiotherapy of Tuberculosis of the Female Genitalia (Strahlenbehandlung der Tuberkulose der weiblichen Geschlechtsorgane). *Ergebn. d. med. Strahlenforsch.* 1936 7 399.

The healing of genital tuberculosis by means of x-ray therapy does not depend on the direct action upon the bacteria or the primary increase of the stimulus or function of the counteracting tissue but rather it is due to the fact that because of injury to the lymphocytes and round cells specific and unspecific protective matter is freed which stimulates the proliferating granulation tissue and cicatrization. The general effect is only the result of the local changes. Just as in every other local treatment of tuberculosis x-ray therapy must be supported through general measures which tend to increase the prophylactic effectiveness of the organism. The diagnosis of genital tuberculosis with the certainty required for radiotherapy without

operative exposure and histological investigation is one of the most difficult in gynecology; surgical measures for diagnostic purposes are often unavoidable. Treatment by radiotherapy has the advantage over operative procedure in that it is without danger. Injury to the skin and ovaries can easily be avoided. The treatment lasts much longer, however, from three to six months. The x-ray treatment of tuberculosis of the adnexa should be made available to the general public through the medium of public health resorts.

Exclusive of isolated cases with large, loose abscessed tubes, ascites, mixed infections with abscesses and septic symptoms, the treatment should begin immediately after diagnosis, independently of the question of operability. If the exploratory laparotomy reveals tuberculosis, radiotherapy should follow immediately as well as after extirpation. The periods of irradiation should be prolonged in order to decrease the ovarian function whenever menstruation results in the aggravation of the general condition; otherwise, short exposures averaging from 35 to 100 r in the focus of infection will suffice. The frequency and distance of the exposures vary; hard rays with from 0.6 to 1 mm. of copper and a voltage of from 170 to 200 kilovolts are used. Filtration should be done with 0.5 mm. of copper or zinc. Unit doses do not exist; schematic procedures should be avoided. Single doses are to be smaller and the distance greater the more acute the course of the disease. Larger doses are to be used in case of urgent need to counteract pain and in fistulas from 200 to 300 r if the ovaries need not be considered. When conception is still a possibility and during pregnancy x-ray treatment is excluded. A combination of general treatment with x-ray therapy is much more successful than surgical treatment as the cures and improvements amount to 81 per cent and the mortality to only 11.8 per cent. Radium therapy is allowed in uterine tuberculosis only when the adnexa are found to be intact after an examination under narcosis; otherwise x-ray therapy should be used. For portio tuberculosis intravaginal radium application in small doses is successful but when the ovaries must be saved ultra-violet therapy should be substituted.

(STIEVERS) CLARENCE C. REED, M.D.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Young, J.: The Habitual Abortion and Stillbirth Syndrome and Late Pregnancy Toxemia. *Brit M J*, 1937, 1 953

The author reports the completed and consecutive histories of 17 women who between them had 51 successive pregnancies ending in abortion, premature stillbirth, stillbirth, or early neonatal death before coming to treatment. In 17 subsequent pregnancies under treatment with urinary prolan, 15 living infants were born; that is, 100 per cent failure was transformed into 88.2 per cent success. The circumstances attending the administration of prolan and progesterone strongly suggest that it operates in the form of a true substitution therapy.

Women with a history of repeated abortion seem to be exposed to a special risk of toxemia in a pregnancy which extends into the later months. In a case under treatment because of a history of repeated abortion, the successful continuation of the pregnancy into the last trimester as the result of the substitution therapy may unmask the toxemic taint.

The evidence which has become available within recent years is consistent with the theory that an important cause of the habitual abortion, the stillbirth syndrome which has baffled the clinician in the past, is a disturbance in the metabolism of pregnancy in which a deficiency of Vitamin E is involved. These findings raise the question as to the part which Vitamin E plays in the prolan-progesterone mechanism of pregnancy.

The considerations mentioned may likewise supply us with the missing factor which the author has previously postulated to explain the non-toxic recurrence of abortion, stillbirth, and accidental hemorrhage in women who are subject to eclampsia and pre-eclampsia. The evidence is consistent with the theory that major degrees of deficiency tend toward interruption of pregnancy in the early months without toxemic manifestations, whereas if the deficiency is less marked the pregnancy is capable of progressing to the later months with the consequent risk of toxemia.

CHARLES BARON, M.D.

LABOR AND ITS COMPLICATIONS

Smythe, H. J. D., and Thompson, D. J.: Induction of Labor by Rupture or High Puncture of the Membranes. *J Obst & Gynaec Brit Emp.*, 1937, 44 480

The author lists the chief indication for the induction of labor as disproportion, whether due to contracted pelvis, an abnormally large child, or postmaturity. Another indication is albuminuria of pregnancy when medical treatment has failed and

pre-eclamptic symptoms supervene. Patients with chronic nephritis whose pregnancies have been able to proceed to the period of viability under treatment, and patients with a history of fetal death just before term are also suitable for the induction of labor.

The author performs induction in one of two ways, the first is by simple rupture of the membranes at the internal os, and is done with or without anesthesia; the other is by high puncture of the membranes. One finger is inserted into the cervix and passed up until the head can be felt. An S-shaped cannula is then inserted along the finger until it meets the head and then passed between the membranes and the uterine wall above the head where the membranes are punctured by pressing home the stylet. From 10 to 16 oz. of liquor are withdrawn. The special advantage of this method is that the chances of infection of the liquor are greatly diminished. This is of great importance should cesarean section become necessary in the course of a trial labor. With either method if labor has not started in forty-eight hours, medical induction is instituted with castor oil or quinine, enemas, and pitocin. This is just the reverse of American practice in which medical induction precedes the rupture of the membranes.

Of 210 cases in which labor was induced, 129 were cases of disproportion. The size of the fetal head relative to that of the pelvis is taken as an index rather than the actual measurements. Forty-one of the patients presented toxemic conditions, including eclampsia. There were sixteen cases of placenta previa other than central. The cannula method is contra-indicated in these cases because of the danger of further separation.

HARRY W. FINK, M.D.

Bell, A. C., and Playfair, P.: Acetylcholine in the Treatment of Uterine Inertia. *J Obst & Gynaec. Brit Emp.*, 1937, 44 470

During the last two years twenty-three cases of uterine inertia have been treated by the authors by means of intramuscular injections of acetylcholine. In their experience it has proved more successful than the other preparations used, which included among others: estrin, pitocin, pituitrin, pituchinol, and quinine. The drug was not given until sedatives and minor stimulants had failed. Harmful effects were not observed either on the mother or child. It was found essential to give the full dosage in order to obtain effects. The most effective method was found to be four intramuscular doses of 0.2 gm. of acetylcholine at three-hour intervals.

The full dosage should be given in all cases, even though the inertia appears to have responded to treatment before the fourth dose has been given.

It is possible that by using acetyl-B-methyl choline (mecholy), a drug with a similar action to acetylcholine but having a more prolonged and con-

size of a hen's egg. The tumor was distinguished by a deep blue color. It adhered to the surface skin and presented only an indistinct delimitation from its surroundings. Clinical diagnosis disclosed primary melanosarcoma of the vulva and histological examination confirmed the clinical diagnosis. Since the patient refused her consent to a radical operation, all that could be attempted was the extirpation of the nodule. In the course of two months metastases appeared in the bordering glands. X-ray therapy was also refused by the patient. After a period of six months death occurred. Including this case, the literature contains a record of only 89 cases of melanosarcoma of the vulva.

The third case was that of a patient thirty-four years old who a year previously had noticed on her outer genitals a nodule which had been growing steadily. The gynecological examination revealed a tumor on the right large labium pudendi the size of a fist of hard consistency and uneven surface. The tumor was stationary. The histological examination revealed an inflamed fibromyoma. Removal was accomplished by operation. In the literature 19 similar cases were found.

(B. KOWATSKI) CLARENCE C. REED, M.D.

MISCELLANEOUS

Bickenbach, W. Radiotherapy of Tuberculosis of the Female Genitalia (Strahlenbehandlung der Tuberkulose der weiblichen Geschlechtsorgane). *Ergebn d. med. Strahlenforsch.* 1935 7: 299.

The healing of genital tuberculosis by means of x-ray therapy does not depend on the direct action upon the bacteria or the primary increase of the stimulus or function of the counteracting tissue, but rather it is due to the fact that because of injury to the lymphocytes and round cells specific and un-specific protective matter is freed which stimulates the proliferating granulation tissue and cicatrization. The general effect is only the result of the local changes. Just as in every other local treatment of tuberculosis, x-ray therapy must be supported through general measures which tend to increase the prophylactic effectiveness of the organism. The diagnosis of genital tuberculosis with the certainty required for radiotherapy without

operative exposure and histological investigation is one of the most difficult in gynecology. Surgical measures for diagnostic purposes are often unavoidable. Treatment by radiotherapy has the advantage over operative procedure in that it is without danger. Injury to the skin and ovaries can easily be avoided. The treatment lasts much longer, however, from three to six months. The x-ray treatment of tuberculosis of the adnexa should be made available to the general public through the medium of public health resorts.

Exclusive of isolated cases with large, loose abscesses and septic symptoms, the treatment should begin immediately after diagnosis, independently of the question of operability. If the exploratory laparotomy reveals tuberculosis, radiotherapy should follow immediately as well as after extirpation. The periods of irradiation should be prolonged in order to decrease the ovarian function whenever menstruation results in the aggravation of the general condition; otherwise, short exposures averaging from 35 to 100 r in the focus of infection will suffice. The frequency and distance of the exposures vary: hard rays with from 0.6 to 1 mm. of copper and a voltage of from 170 to 200 kilovolts are used. Filtration should be done with 0.5 mm. of copper or zinc. Unit doses do not exist; schematic procedures should be avoided. Single doses are to be smaller and the distance greater the more acute the course of the disease. Larger doses are to be used in case of urgent need to counteract pain and in fistulas from 300 to 500 r if the ovaries need not be considered. When conception is still a possibility and during pregnancy x-ray treatment is excluded. A combination of general treatment with x-ray therapy is much more successful than surgical treatment as the cures and improvements amount to 82 per cent and the mortality to only 11.8 per cent. Radium therapy is allowed in uterine tuberculosis only when the adnexa are found to be intact after an examination under narcosis; otherwise x-ray therapy should be used. For portio tuberculosis intravaginal radium application in small doses is successful, but when the ovaries must be saved, ultra-violet therapy should be substituted.

(STIEVERS) CLARENCE C. REED, M.D.

lochia does not give sufficiently definite information, on account of associated or secondary infections. Nevertheless, blood cultures should be made in series, and bacteriological examination of any local suppurations that may develop should also be made. If some other organism than the streptococcus is found the serum therapy is discontinued.

The author first used this serum in the treatment of puerperal infection at the Tenon Maternity Hospital in 1931. This first case, which has been reported previously, is briefly reviewed here. The patient made a good recovery; a relatively small amount of serum, 270 c. cm., was given intravenously. The author also reports 8 illustrative cases from the Hôpital Boucicaut in which the serum proved to be of definite therapeutic value. All of the patients made a good recovery, although 3 had positive blood cultures, 2 peritonitis, and 1 thrombophlebitis. He reports 5 fatal cases in which serum therapy was employed; these were the only deaths from puerperal infection during the routine use of serum therapy from April 1, 1932, to December, 1936, in 12,748 deliveries. In 2 of these, death was due to secondary peritonitis; in 3 to septicemia; in the first 2 cases the serum was given late in the course of the disease.

In a study of the published statistics of the mortality rate in puerperal infection from various clinics, the author finds that it is approximately 2 per 1,000 deliveries. This was the rate recorded during his service at the Tenon Maternity Hospital in 1930 and 1931, where serum therapy was not employed except in the one case cited. In his service at the Hôpital Boucicaut from 1932 to 1936, when serum therapy was routinely employed, there were only 5 deaths in 12,748 deliveries, a rate of approximately 0.4 per cent per 1,000. In the first three months of 1932 at this hospital before serum therapy was employed, there were 3 deaths from puerperal infection in 750 deliveries. It was this unusually high mortality that induced the author to try serum therapy. He notes that there is nothing unusual in the general obstetrical technique at this hospital, and that no important change has been made in this technique in the last few years. He is inclined to regard this reduction in the death rate from puerperal infection as due in large part to the use of serum therapy, although he admits that it may be due to an unusually favorable series of cases. At any rate he is convinced that his experience has shown the definite value of serum therapy in puerperal infection.

ALICE M. MEYERS.

stant effect better results may be obtained in the treatment of uterine inertia HARRY W FINK M D

PUERPERIUM AND ITS COMPLICATIONS

Clayman S J Gonorrhea and the Puerperium (Gonorrhoe und Wochenbett) 1935 Zurich Dissertation

At the Zurich University Clinic for women 206 cases of gonorrhea were observed among 25 770 births. On account of its stealthy course, it is usually very difficult to arrive at a diagnosis. Its ability to spread is increased especially after the gonococci have reached the adnexa. If the gonococci penetrate into the uterine cavity a miscarriage can take place as the result of chronic endometritis. The parturition itself also the operative type is not affected by gonorrhea nor has it been definitely established that there is a connection between premature rupture of the fetal membranes and gonorrhea. The course of the puerperium was accompanied by fever in 64 (31 per cent) of the cases. In 35 cases the fever appeared before the eighth day in 29 after the eighth. Ten (4.9 per cent) of the puerperal women became ill with adnexitis, which was accompanied by pain due to pressure in the abdomen in 9, in only one case, the pain was absent. The rate of blood sedimentation is always advanced in inflammation of the uterine adnexa. The temperature cannot always be regarded as a criterion of the state of the adnexal inflammation. Rest in bed is a very effective means against advancement of the infection during the puerperium. Regarding sterility and the healing of the adnexal inflammation the author cites the data of other authors.

The following complications were observed, 3 cases of peritonitis, 2 of gonorrheal arthritis and 1 case of thrombophlebitis. In spite of the use of Credé's procedure of instilling 1 per cent silver nitrate solution into the eyes of the newborn there were 3 cases of ophthalmoblenorrhoea gonorrhoea and 1 case of vulvovaginitis gonorrhoea.

(A BAUER) CLARENCE C REED M D

Eccalle G Serotherapy and Puerperal Infection (Sérothérapie et infection puerpérale) Rev franc de gynéc et d obst 1937 32 1

Eccalle notes that it is seven years since Vincent described a new anti streptococcus serum before the Académie des Sciences and reported that he had found it therapeutically effective. Since that time this serum has been used by a number of physicians in the treatment of puerperal sepsis many of them have reported good results but others have not found it of definite value.

In attempting to determine the true therapeutic value of this serum it should be remembered that because a patient recovers after its administration is not proof that recovery was due to this treatment. Nothing is more difficult than to determine the prognosis accurately in a case of puerperal fever.

On the other hand, if a patient dies after the administration of the serum, it does not indicate that serum therapy is of no value. Such a conclusion is certainly not justified if the serum is given late or in insufficient doses or if the disease is of an especially severe type. Without pushing the comparison too far, it may be noted that anti diphtheritic serum, in spite of its undoubted value also has its failures particularly in epidemics of unusual severity.

For more than four years the author has used Vincent's anti streptococcus serum in the treatment of all cases of puerperal infection at the Hôpital Boucicaut in Paris. The general principles followed in the use of this serum in puerperal infection are those laid down by Vincent and his associates which are summarized as follows:

1 Treatment must be started early. Whenever a woman in the puerperium shows a temperature above 39 C that cannot be explained by some definite cause other than possible uterine infection serum treatment is instituted. A series of prophylactic injections is also given if a woman shows a definite rise in temperature during labor, or under goes a difficult obstetrical operation. Three to four injections of from 30 to 50 c cm of serum are given in these cases.

2 The amount of serum injected depends upon the condition of the patient and may vary from 30 to 100 c cm. These doses are usually repeated until the temperature drops. Often the author has noted so marked a remission of the symptoms that he has discontinued the serum treatment but has had to begin it anew because of recurrence of the fever. In severe cases with chills a dose of from 50 to 100 c cm daily has almost always been employed some patients who recovered received a total dosage of 2 600 c cm of serum.

3 Injections have been given subcutaneously or intramuscularly only in very severe cases has the serum diluted four or five times with physiological saline solution been given intravenously. Intravenous injection was stopped whenever the patient showed any general reaction.

Serum therapy never caused serious reactions in the author's experience. When patients had been previously sensitized to horse serum the first therapeutic injection was preceded by the administration of 35 c cm of serum according to Besredka's method. Some serum reaction may occur in spite of the administration of sodium salicylate as advised by Vincent.

In the more severe cases the author has employed blood transfusions of 200 300 or 400 c cm of blood in addition to the serum therapy. Only occasionally has any form of chemotherapy or a fixation abscess been used.

Instituting serum therapy on clinical indications is preferable to awaiting a definite bacteriological diagnosis. This is true because a blood culture is rarely positive in the early stages of puerperal infection and bacteriological examination of the

The third case was diagnosed as a cyst of the kidney, which diagnosis was confirmed at the transperitoneal operation. Fluid was evacuated with a trocar and the cyst was excised. It was thought that this cyst had terminated the usefulness of the kidney as the remaining renal mass was only one-half the size of a normal organ. However, conservative treatment was followed. For eight months the patient was relieved of all symptoms; then hematuria occurred and pathology was indicated in the opposite kidney, while the kidney from which the giant cyst had been removed had apparently returned to normal size with a normal pelvis and was functioning normally.

These cases are cited to show the splendid recuperative power of the kidney if it is treated conservatively
ELMER HESS, M.D.

Stevens, A. R.: Pelvic Single Kidneys. *J. Urol.*, 1937, 37 610

The author refers to the embryological status and not to the anatomical form of the kidney, and considers only ectopic single kidneys. In the sixteenth century, cases of this type were frequently reported by anatomists.

Autopsy records derived from many sources indicate that 1 ectopic kidney is found in from 500 to 1,100 autopsies, whereas 1 true pelvic kidney is found in from 2,150 to 3,000 autopsies. In other words, every third or fourth ectopic kidney is pelvic. In the present study, the author cites the reports of twenty-five cases of single kidney located in the bony pelvis, and adds two of his own. We may, therefore, presume that approximately only 4 or 5 per cent of all single kidneys are true pelvic kidneys. In round figures, if we may expect a solitary kidney once in every 1,000 persons, a solitary pelvic kidney may be expected in one of about every 22,000 persons.

The indications for treatment of ectopic kidney, surgical or otherwise, are in general governed by the well known urological principles employed when the organs are normally situated. However, because of the relatively poor drainage and mild hydronephrosis universally present in ectopic kidneys, and the irregular and frequently multiple blood supply, nephrectomy is more commonly demanded when a normal kidney is elsewhere present in the body.

When the pelvic kidney is the only one present, the situation is grave because of the vital need of, and at the same time the increased difficulty of, conservatism. In contrast, other ectopic kidneys usually have vascular attachments on one side only, and their location is more accessible.

In the series of twenty-seven cases of pelvic single kidney reviewed, a satisfactory description of the blood supply was given in only a few. In three, including the one operated by the author, the vessels supplying the kidney apparently came from the region of the bifurcation of the aorta only, none entered the kidney laterally, and a freer manipulation of the kidney for conservative measures was possible.

The sex of the patient was stated in sixteen cases,

there were five males and eleven females. The ages varied from a fetus up to forty-eight years. A calculus was noted in three cases, and was operated upon successfully in two. An abnormality or deficiency of the sexual apparatus was noted in fourteen women; this is a common finding. Many of these findings were autopsy observations. In two cases, the single kidneys were removed together with or for supposed neoplasm with subsequent anuria and death, both of the cases were reported over twenty-five years ago. Nephrostomy was performed once and lithotomy twice, all three operations were successful.
HARRY W. FLAGGEMEYER, M.D.

Sargent, J. C.: Hydronephrosis: A Clinical Study of the Structural Involution that Follows Surgical Release of Obstruction. *J. Urol.*, 1937, 37 631

Sargent presents a discussion of the structural involution of the renal pelvis that follows surgical release of obstruction, and bases his study on nine cases of plastic surgery at the ureteropelvic juncture, as well as several cases in which the obstruction was released by surgical correction of angulations, fibrous bands, anomalous vessels, and compressing extra-urinary tumors. He concludes that large hydronephrotic kidneys may show a startling power of anatomical involution and even the more fixed calyces may resume more normal proportions. Even though the anatomical involution be incomplete, if the obstruction is relieved, the quantity of residue in the renal pelvis remains proportionally slight, and then it is more a matter of vacuum retraction than of actual retention. The relation of measured residue to measured pelvic capacity offers a gauge of the technical success with which the obstruction has been removed.
FRANK M. COCHEMS, M.D.

Melvin, P. D., and Andrews, J. C.: Nephrolithiasis and Cystine Excretion in Cystinuria. *J. Urol.*, 1937, 37 655

Melvin and Andrews have closely studied a patient with cystinuria accompanied by calculus formation in the right kidney. Following a right nephrolithotomy the composition of the drainage from that kidney was compared with that of the urine collected through the urinary bladder from the other kidney. The drainage from the operated kidney, although normal as regards the other urinary constituents, failed to show evidence of cystine during the immediate postoperative period. After the incision was closed, separate specimens of urine obtained by ureteral catheterization revealed comparable amounts of cystine. Seven months later urine from the right or operated kidney contained a higher cystine concentration than that from the left kidney.

The authors state that it has frequently been noted that the deposition of kidney stones in cystinuria is confined to one kidney and that the other, presumably excreting cystine, remains free from calculi. Cystine stones have a marked tendency to

GENITO-URINARY SURGERY

ADRENAL KIDNEY, AND URETER

Broster L R Eight Years Experience with the Adrenal Gland *Arch Surg* 1937, 34, 61

The author presents a series of twenty three cases of virilism. He traces the history of abnormal sexuality from antiquity as well as the scientific investigative efforts since Cook first established the association of hypertrichosis and adiposity with tumor of the adrenal gland. The comparative anatomy of sexual reproduction and the primary and secondary sex characteristics are discussed.

His observations led him to believe that the adrenogenital syndrome is associated with retrogression of the primary and secondary feminine sex characteristics and functions. The featured symptoms include (1) appearance of hair in the female according to male distribution (2) alterations in body contour, (3) immature development of the female genitalia both external and internal and degeneration of the ovaries and (4) psychological abnormalities.

He divides the adrenogenital syndrome into the following subdivisions:

1. Adrenal pseudo hermaphroditism
2. Adrenal virilism
3. Achard Thiers syndrome probably allied to Cushing's syndrome
4. Post menopausal virilism

Pre operative investigations were made of the blood chemistry gastric acidity, and the sugar tolerance of the fasting patient and a roentgenogram was taken of the sella turcica. Mainly negative results were found and the best information was obtained by direct palpation after an exploratory laparotomy. The author prefers the trans thoracic route for surgical approach and his best results were obtained in cases of post pubertal virilism. In the cases presented differential diagnosis had to be made from (1) arrhenoblastomas (2) tumors of the hypothalamus and (3) Cushing's syndrome. The author demonstrated a specific differential staining reaction in cells of the adrenal cortex which was absent in the controls.

DONALD K HIBBS M D

Greene C H Clinical Use of Extract of the Adrenal Cortex. Report on Thirty Four Cases of Addison's Disease Studied Between 1930 and 1937 with a Review of the Literature *Arch Int Med* 193 59 59

Over a period of seven years the author studied thirty four cases of Addison's disease and he reports his observations regarding therapy with salt and an extract of the adrenal cortex. He believes that little was added to the life expectancy but in a limited group of cases life was prolonged. Therapeutic administration of adrenal cortex appears

specific and constitutes a reliable therapeutic test. The variable results of investigators may be explained by the variations in composition of the different extracts used. A better understanding of adrenal insufficiency rests with the chemists who it is hoped will be able to isolate the principles of the extracts in a pure state.

DONALD K HIBBS M D

Geisinger J F The Recuperative Power of the Kidney A Report of Three Cases *J Urol* 1937, 37 639

The urologist today approaches renal problems from a conservative surgical viewpoint. Kidneys which are spared today may be desperately needed tomorrow, and all renal pathology must be approached from this point of view. It must not be forgotten that there will always be a group of cases that need radical nephrectomy but there are many other conditions in which partial resection of the kidney or plastic operations upon the pelvis of the kidney may leave the individual with sufficient functioning parenchyma to protect him against future disturbances.

Three cases are reported to show the recuperative ability of the renal parenchyma.

The first case was that of a white man aged thirty seven years who had an extravasation of urine through the upper ureter on the right side due to local necrosis or gangrene from an impacted calculus. The opposite side was normal. Operation was considered urgent. The family refused operation. During the six weeks in which operation was refused by the family the calculus was expelled from the ureter. The extravasated pus and urine drained back through the ureter and the cavity it occupied shrank gradually. The perinephritic tissues recovered their plasticity and free drainage through this ureter gradually eliminated the infection in the pelvis and the kidney became virtually normal. No operation was performed. Subsequently it was necessary to operate upon the opposite kidney for calculous disease and the patient became dependent on the right kidney.

In the second case there was a large hydronephrosis with obstruction at the ureteropelvic junction. Nephrectomy seemed clearly indicated. Again domestic complications arose and operation was not done. Some months later an intravenous urogram showed that instead of the supposed auto-nephrectomy on this side the long period of catheter drainage permitted some adjustment of the situation at the ureteropelvic junction. At all events obstruction was no longer present. The huge pelvis either shrank or folded upon itself, was not greatly reduced in size and what had seemed almost certainly a dead or dying kidney was definitely alive from a functional viewpoint.

for differential diagnoses in 52 other cases of acute abdominal conditions and found to be normal. In 20 of 26 cases of descending non-specific acute pyelitis the urograms were normal, but in some cases they resembled those of renal and ureteral lithiasis. However, these cases were readily differentiated by the symptoms.

On the basis of non-protein nitrogen determinations of the blood it seems that no serious complications occurred from intravenous urography in cases of renal and ureteral stones and acute abdominal conditions. Transient bilirubinemia was noted in only 2 cases. The author claims that urography done in the acute stage is a distinct aid in the diagnosis of renal and ureteral stones, especially in the presence of small concretions and sand accumulations, also, in the differential diagnosis between nephrolithiasis and acute abdominal conditions. In addition, it is harmless.

In 665 definite cases of renal and ureteral lithiasis which were diagnosed roentgenologically in the period from 1923 to 1936, and according to reports in the literature, roentgenological diagnosis of cases of renal and ureteral stone was reliable in from 70 to 85 per cent of the cases. In renal lithiasis it was reliable in from 95 to 98 per cent, and in ureteral lithiasis, from 70 to 80 per cent. With intravenous urography the results of treatment can be improved, especially in ureteral lithiasis, in which diagnosis is correct in more than 90 per cent of the cases.

In definite cases of lithiasis examined during the period from 1923 to 1933 with simple roentgenography, the latter failed in 24.7 per cent of all the cases and in 42.9 per cent of the cases of ureteral calculi. In a similar material examined during the period from 1933 to 1936 with intravenous urography, there was failure in only 6.5 per cent of all the cases and in only 8.7 per cent of the cases of ureteral calculi.

Investigation of the prognosis in surgically and conservatively treated cases of renal and ureteral lithiasis in the first period showed the following:

In the surgically treated cases the true recurrences amounted to from 5 to 20 per cent, mostly within the first two years, in the conservatively treated cases the clinical recurrences amounted to from 45 to 65 per cent. In the conservatively treated cases of indefinite but probable lithiasis the clinical recurrences amounted to from 25 to 35 per cent. The clinical recurrences in the entire material amounted to from 35 to 50 per cent.

Twenty-three of the 160 patients who were operated upon for renal and ureteral lithiasis died, 13 postoperatively, and 10 subsequently. Of the patients who were treated conservatively, 45 died.

LOUIS NEUWELT, M D

Ochuly, E. A., and Douglass, F. M.: Retroperitoneal Perirenal Lipomas. *J Urol*, 1937, 37 619

The normal fatty tissues which surround the kidneys may produce tumors that reach an enormous size and produce death either through cachexia or the compression of vital structures.

Perirenal lipoma must be differentiated from lipoma of the kidney, which develops in the parenchyma and at the expense of the kidney, as well as from fibrolipomatosis or so-called fat replacement of the kidney, which has always been associated with infection, or stone, or both, in the kidney and produces atrophy through fatty infiltration and replacement. A perirenal lipoma must be a proliferative change in the normal fatty envelope of the kidney, lying in close anatomical relation to, but not invading, the organ.

This tumor, the development of which is slow and progressive, spreads around the kidney, completely or partially encircles it, and usually dislocates it from its normal position. As the tumor enlarges anteriorly, it encounters the posterior parietal peritoneum which it drives forward and thereby displaces the large intestine, and at times invades the mesentery. Posteriorly, the muscular plane of the lumbar wall checks the tumor, above, the diaphragm marks its boundary, and below, the tumor projects its prolongations into the iliac fossa. The great prevertebral vessels, the duodenum, and the pancreas usually maintain their normal positions.

In contrast to their size the symptoms produced by these tumors are relatively few. Their onset is always insidious. It is often only by chance that the tumors are discovered. In the case reported by Salzer, a friend called attention to the fact that the patient's abdomen was increasing in size. Symptoms of compression are not frequent until at a terminal stage. Anuria, constipation, vague abdominal cramps, intermittent abdominal distention, and melena have been recorded. Edema also has been noted, and abdominal varicosities have been reported. In unoperated cases that came to autopsy, compression of the lungs, intestines, or ureters, and cachexia have been listed as the causes of death.

The urinary symptoms are usually conspicuous by their absence. Urinary frequency has been noted at times, and urinalysis has occasionally revealed a few red and white blood corpuscles. It is an interesting fact that these tumors cause severe loss of weight and cachexia in a late stage. Even in the cases of the severest emaciation, the fat cells in these tumors are always fully distended, apparently unable to liberate the fat for metabolism.

Theoretically, a colonic filling and x-ray or fluoroscopic examination should be of diagnostic aid in establishing the tumor as a retroperitoneal neoplasm. Pyelography, one of the most exact means of diagnosis in regard to establishing the location, has been employed comparatively seldom. The question of intra-abdominal, extraperitoneal, intrarenal, or extrarenal location has been correctly answered in a high percentage of cases when pyelography has been employed. Upon pyelo-ureterography deformity of the renal pelvis may be observed but of great importance is the distorted course of the ureters, which should be an important point in localizing the tumor as retroperitoneal. Anterior, posterior, or lateral rotation of the kidney is fre-

recur, but prevention is possible by removal of all foci of infection by a copious fluid intake and the establishment of free urinary drainage. In addition, there should be a moderate restriction of proteins and the patient should be given alkalies.

FRANK M. COCHENS, M.D.

Wulff, H. B. *The Reliability of Roentgen Diagnosis Especially Regarding the Value of Urography and the Prognosis in Renal and Ureteral Calculi* (Die Zuverlässigkeit der Roentgenendiagnostik—Besonders hinsichtlich des Wertes der Urographie—und die Prognose bei Nieren- und Harnleitersteinen) *Acta radiol.* 1936, Supp. 52.

The author's material consists of 1,035 patients treated for renal and ureteral stones at the Surgical Clinic of Lund from 1923 to 1936 inclusive, of which 160 were operated upon, 508, with definite calculi were treated conservatively and 477 presented uncertain, but probable, cases of calculi.

From 1933 to 1936 all patients with acute renal and acute indefinite abdominal conditions suspected of disease of the urinary passages were subjected to intravenous urography. In patients with demonstrable or suspected acute glomerulonephritis or chronic nephritis and those with visible icterus or serious abdominal conditions urography was omitted. The patients with acute abdominal conditions were subjected to urography either during the painful attack or at the latest two days after the occurrence of the acute pains or the painful conditions in the abdomen and the renal or ureteral regions. Among these were 224 patients with nephrolithiasis, 31 with acute appendicitis, 52 with other acute renal and abdominal conditions and 26 with acute pyelitis. For purposes of analysis these patients were divided into two main groups. Group 1, in which the urography was done during the painful attack, and Group 2, in which the urography was done during freedom from pain but at least two days after the painful attack has subsided.

Group 1 included 123 patients with clinically definite renal and ureteral calculi which were divided into three groups:

1. Those in whom the roentgenograms and urography showed positive stone findings and a stasis of the contrast medium above the demonstrable obstruction or calculus.

2. Patients in whom the roentgenogram was normal, i.e., with no definite concrement shadow, but nevertheless a stasis of the excretory material above an undiagnosable obstruction. In these patients there were always minute ureteral concretions or collections of sand.

3. Patients in whom the roentgenograms were negative during the painful attack and in whom there was no stasis of the excretory material.

There were 85 patients in the first group with positive stone findings and stasis of the excretory material. Not rarely there were relatively large renal and ureteral stones but in most patients the stones were the size of rice grains or smaller and in

some there was sand. Of these 85 patients, 36 passed the stones spontaneously. In 36 patients the stasis of the excretory material above the demonstrable obstruction was so pronounced that the excretion of the material was delayed on the involved side. In 42 patients the stasis of the excretory material was due to distinctly dilated renal pelvis, calyces and the ureter filled with contrast medium to a demonstrable obstruction and in 7 patients to only slightly dilated ureters filled with contrast medium or to undilated ureters. It was also found that in 62 patients in whom a definite diagnosis of renal or ureteral stone was impossible with plain roentgenography urographic methods established the diagnosis whereas a diagnosis of stone could have been made without urography in only 23. These findings show that urography is of great help in the diagnosis of minute urinary concretions.

In Group 2 there were 41 patients with negative stone findings and stasis of the excretory material. Twenty showed a distinct stasis. In 14 the roentgenogram showed distinct dilatation of the renal pelvis and ureter filled with contrast medium and in 7 only a slight stasis was visible.

In Group 3 consisting of 2 patients no stone was demonstrable and the urographic picture was normal. Either the method in these cases was unreliable or the clinical diagnosis was incorrect.

Like Group 1 the patients in Group 2 were divided into three groups: (1) patients in whom a stone plus stasis of the excretory material was found, including patients with stone but no stasis; (2) patients in whom no stone but positive stasis was found; and (3) patients in whom no stone was found and who showed normal urographic findings.

In the first subdivision there were 43 patients of whom 3 passed concretions spontaneously. Possibly only 2 of these could have been diagnosed definitely with simple roentgenography. In the case of 1 patient simple roentgenography revealed clear concrement shadows whereas the urographic findings during the painful interval were normal.

There were 20 patients with negative stone findings and stasis of the excretory material in the second subdivision. In 7 there was a pronounced stasis of the excretory medium with delayed excretion, in 4 there was distinct dilatation of the renal pelvis and in 9 there was slight stasis. The stones passed spontaneously nine times.

The third subdivision included 12 patients. The large number of negative roentgen and urographic findings was probably due to the presence of other acute abdominal diseases even though these patients were carefully examined. Therefore it appears that the outlook for positive urographic findings when urography is instituted during the painful attack is considerably better.

Intravenous urography was done in the following acute abdominal conditions in 35 cases of acute appendicitis and in 7 of 17 cases of gangrenous appendicitis lying next to the right ureter. The urograms were normal in all. Urograms were taken

for differential diagnoses in 52 other cases of acute abdominal conditions and found to be normal. In 20 of 26 cases of descending non-specific acute pyelitis the urograms were normal, but in some cases they resembled those of renal and ureteral lithiasis. However, these cases were readily differentiated by the symptoms.

On the basis of non-protein nitrogen determinations of the blood it seems that no serious complications occurred from intravenous urography in cases of renal and ureteral stones and acute abdominal conditions. Transient bilirubinemia was noted in only 2 cases. The author claims that urography done in the acute stage is a distinct aid in the diagnosis of renal and ureteral stones, especially in the presence of small concretions and sand accumulations; also, in the differential diagnosis between nephrolithiasis and acute abdominal conditions. In addition, it is harmless.

In 665 definite cases of renal and ureteral lithiasis which were diagnosed roentgenologically in the period from 1923 to 1936, and according to reports in the literature, roentgenological diagnosis of cases of renal and ureteral stone was reliable in from 70 to 85 per cent of the cases. In renal lithiasis it was reliable in from 95 to 98 per cent, and in ureteral lithiasis, from 70 to 80 per cent. With intravenous urography the results of treatment can be improved, especially in ureteral lithiasis, in which diagnosis is correct in more than 90 per cent of the cases.

In definite cases of lithiasis examined during the period from 1923 to 1933 with simple roentgenography, the latter failed in 24.7 per cent of all the cases and in 42.9 per cent of the cases of ureteral calculi. In a similar material examined during the period from 1933 to 1936 with intravenous urography, there was failure in only 6.5 per cent of all the cases and in only 8.7 per cent of the cases of ureteral calculi.

Investigation of the prognosis in surgically and conservatively treated cases of renal and ureteral lithiasis in the first period showed the following:

In the surgically treated cases the true recurrences amounted to from 5 to 20 per cent, mostly within the first two years, in the conservatively treated cases the clinical recurrences amounted to from 45 to 65 per cent. In the conservatively treated cases of indefinite but probable lithiasis the clinical recurrences amounted to from 25 to 35 per cent. The clinical recurrences in the entire material amounted to from 35 to 50 per cent.

Twenty-three of the 160 patients who were operated upon for renal and ureteral lithiasis died, 13 postoperatively, and 10 subsequently. Of the patients who were treated conservatively, 45 died.

LOUIS NEUWELT, M.D.

Ockuly, E. A., and Douglass, F. M.: Retroperitoneal Perirenal Lipomas. *J. Urol.*, 1937, 37, 619.

The normal fatty tissues which surround the kidneys may produce tumors that reach an enormous size and produce death either through cachexia or the compression of vital structures.

Perirenal lipoma must be differentiated from lipoma of the kidney, which develops in the parenchyma and at the expense of the kidney, as well as from fibrolipomatosis or so-called fat replacement of the kidney, which has always been associated with infection, or stone, or both, in the kidney and produces atrophy through fatty infiltration and replacement. A perirenal lipoma must be a proliferative change in the normal fatty envelope of the kidney, lying in close anatomical relation to, but not invading, the organ.

This tumor, the development of which is slow and progressive, spreads around the kidney, completely or partially encircles it, and usually dislocates it from its normal position. As the tumor enlarges anteriorly, it encounters the posterior parietal peritoneum which it drives forward and thereby displaces the large intestine, and at times invades the mesentery. Posteriorly, the muscular plane of the lumbar wall checks the tumor; above, the diaphragm marks its boundary; and below, the tumor projects its prolongations into the iliac fossa. The great prevertebral vessels, the duodenum, and the pancreas usually maintain their normal positions.

In contrast to their size the symptoms produced by these tumors are relatively few. Their onset is always insidious. It is often only by chance that the tumors are discovered. In the case reported by Salzer, a friend called attention to the fact that the patient's abdomen was increasing in size. Symptoms of compression are not frequent until at a terminal stage. Anuria, constipation, vague abdominal cramps, intermittent abdominal distention, and melena have been recorded. Edema also has been noted, and abdominal varicosities have been reported. In unoperated cases that came to autopsy, compression of the lungs, intestines, or ureters, and cachexia have been listed as the causes of death.

The urinary symptoms are usually conspicuous by their absence. Urinary frequency has been noted at times, and urinalysis has occasionally revealed a few red and white blood corpuscles. It is an interesting fact that these tumors cause severe loss of weight and cachexia in a late stage. Even in the cases of the severest emaciation, the fat cells in these tumors are always fully distended, apparently unable to liberate the fat for metabolism.

Theoretically, a colonic filling and x-ray or fluoroscopic examination should be of diagnostic aid in establishing the tumor as a retroperitoneal neoplasm. Pyelography, one of the most exact means of diagnosis in regard to establishing the location, has been employed comparatively seldom. The question of intra-abdominal, extraperitoneal, intrarenal, or extrarenal location has been correctly answered in a high percentage of cases when pyelography has been employed. Upon pyelo-ureterography deformity of the renal pelvis may be observed, but of great importance is the distorted course of the ureters, which should be an important point in localizing the tumor as retroperitoneal. Anterior, posterior, or lateral rotation of the kidney is fre-

quently noted, and this rotation with displacement of the ureter makes the diagnosis almost certain. The treatment is operative in all cases.

HARRY W. FLAGGMEYER M.D.

Munger A. D. Irradiation of Malignant Renal Neoplasms with Especial Reference to the Effects of Irradiation on the Acquired Single Kidney. *J. Urol.* 1937, 37: 680.

Munger reports a study of five patients with renal tumor with regard to the effects of irradiation both on the tumor and on the tissue of the uninvolved kidney. Two patients had postoperative irradiation only, while three had both pre-operative and post-operative irradiation.

The author concludes that pre-operative irradiation is a beneficial adjunct in the treatment of renal tumors. Irradiation in the large doses used by the author has an irritating effect upon the single normal kidney which effect disappears upon cessation of the treatment. Irradiation in the dosage used has a marked latent depressant effect in the single kidney already damaged by nephritis. If the presence of nephritis is not known and guarded against the irradiation may add sufficient damage to cause death. Super voltage x rays in large doses have proved no more embarrassing to normal renal structures than rays of lesser voltage. FRANK M. COCHENS M.D.

BLADDER URETHRA AND PENIS

Simons I. Cystometry Studies in Bladder Function. VI. A Critical Review with Special Reference to Microcystometry and Sphincterometry. *Brit. J. Urol.* 1937, 9: 132.

The author presents an excellent review of the neuro-anatomy of the autonomic nervous system in its relation to micturition and its connections with the cerebrospinal centers.

He describes the microcystometer and sphincterometer and discusses their value in neurogenic studies of the bladder.

In regard to microcystometry he draws the following conclusions:

Cystometry is a method of physiologically evaluating the tonus of the detrusor muscle by recording its pressure as increments of fluid are injected into the bladder, the sensations experienced by the patient being concomitantly noted. As the norm of the detrusor tonus does not vary greatly it is possible to divide the graphs thus obtained into hypertonia and hypotonia. When an extremely accurate instrument like the microcystometer is used it is possible to divide these two classes into true and false hypertonia and true and false hypotonia. Such a division agrees with the clinical findings of the neurologists as true hypertonia and hypotonia have neurological symptomatology based on neuropathological pathology. Neurogenic bladders of hyper-tonic motor type are the result of breaks in the conduction paths from the higher centers and are due to a loss of inhibition. The detrusor overacts. Neu-

rogenic bladders of hypotonic sensory type are due to diminution or loss of sensation of the vesical mucosa and of the muscular sense of the detrusor. Therefore dysuria may be of pure neurogenic type or of local causation. In some cases these factors are combined.

Cystometry offers to neurology additional information for neurodiagnosis, which may permit early diagnosis in cases that are at present pre-clinical. There is reason to believe that in certain types of luetic infection the bladder function may be affected because the disease is acting directly on the autonomic nervous system long before the brain or spinal cord is attacked. The microcystometer will detect these slight changes and an early diagnosis of autonomic neuropathies may be made. One reason for believing that luetic bladder dysfunction is mostly if not entirely due to deposits in the autonomic nervous system is the result obtained from certain special treatment which causes amelioration of bladder dysfunction, but does not affect the cord or brain lesions. The microcystometer proves this belief to be a fact.

From sphincterometry the following is learned:

The tonus of either vesical sphincter can be separately estimated by means of the sphincterometer, an accessory instrument of the microcystometer. The norm of tonus is 15 mm. of mercury for the internal sphincter and 23 mm. for the external sphincter. Hypertonic detrusors show a moderate elevation in the internal sphincter tonus. Incontinence of urine is probably based on the balance between the tonus of the detrusor and the external sphincter. Retention of urine and residual urine are probably caused by a disturbance in the balance between the detrusor and the internal sphincter.

J. SYDNEY RITTER M.D.

Ladd W. E. and Lanman T. H. Exstrophy of the Bladder. *New England J. Med.* 1937, 216: 637.

Exstrophy of the bladder is one of the conditions in which it is almost always necessary to attempt to make the large bowel the urinary reservoir. Many men particularly Coffey have perfected transplantation of the ureters to the rectum in this congenital condition.

The technique of the operation should be as simple as possible and care should be taken to maintain asepsis. The urinary flow should be uninterrupted. Inlying catheters should not be used in order to avoid ureteritis. The operation should be done in three stages including the cystectomy. The chief difficulties and dangers of ureterostomy are (1) peritonitis that results from leakage or soiling at the site of anastomosis, (2) obstruction of the urinary outflow at the site of anastomosis and (3) urinary tract infection with its resulting kidney damage.

The authors report fifteen cases. Each ureter was transplanted separately. The patients have been followed for periods varying from a few months to five years. The best time for operation was usually

between the ages of three and five. Intravenous pyelograms and determinations of blood chemistry were made, and these were normal enough to lead the authors to the opinion that pre-operative urinary tract infection is a rarity. The oldest patient was twenty-one years of age.

The patient should have several days of hospitalization before operation. Intravenous pyelograms and non-protein nitrogen and phenolsulphonphthalein determinations should be made, in addition to the usual physical examination and routine laboratory studies. The patient should have a low residue diet and a saline enema daily. Active purging is to be avoided as it often results in gas distention in the large bowel. It is desirable to give glucose in generous amounts for forty-eight hours prior to operation. The anesthesia of choice is avertin, 80 mgm per kgm supplemented by gas, oxygen, and ether. The clamped rectal tube, which is used for the administration of the avertin, is left inserted in the rectum.

The exstrophied bladder is carefully walled off with sterile gutta-percha before the patient is draped. The right ureter is transplanted first. After the ureter is freed from its bed almost down to the bladder, where it is tied and cut off with the actual cautery or with an electric knife, the distal end is allowed to drop back behind the peritoneum. After decision as to where the ureter is to be transplanted, the rectal tube is unclamped, the sigmoid is milked to express the gas and liquid contents, and right-angle intestinal clamps are applied. The ureter, with a temporary, indwelling catheter, is then placed on the submucosa in such a way that it will not kink. The edges of the serous and muscular incision are approximated for about three quarters of its length over the ureter by one over and over running stitch of fine silk and another overlapping Cushing suture of fine silk to the serous coat. A longitudinal cut is made in the posterior wall of the ureter to prevent its orifice from becoming constricted. A double-ended suture is placed in the end of the ureter from within outward to evert it. The mucosa of the bowel is opened with the electric knife and the ureter is carried into the lumen of the sigmoid by the double-ended suture, which pierces all layers of the bowel and is tied holding the ureter in place. The two rows of sutures are now completed by closing the opening in the gut and covering the suture that holds the ureter in place. The peritoneum is then closed so as to make the whole line of anastomosis extraperitoneal and the abdomen is closed without drainage. Two weeks later the left ureter is transplanted in a similar manner.

The authors believe that the exstrophied bladder should always be removed later.

All fifteen of the patients operated upon are living and well. There was only one case of peritonitis and, while it was not fatal, it required a secondary operation. In fourteen of the fifteen patients, urine appeared within forty-eight hours and usually within twenty-four hours after the initial trans-

plantation. The authors do not believe in draining the peritoneal cavity.

The oblique, submuscular transplantation of the ureter with its possible valve action so as to obtain an unobstructed and straight flow of urine through the ureter into the bowel is of great importance in preventing urinary-tract infection.

There were no fatalities in these cases, and a good functional result was obtained in every patient.

ELMER HESS, M D

Mortensen, H.: Carcinoma of the Male Urethra, with the Report of a Case. *Brit J Surg*, 1937, 24 669

The author reviews the literature, which includes 109 cases of carcinoma of the male urethra. He presents one such case. The history of the patient is the usual one of the patient with urethral stricture which has been present for many years, in this case for twenty-six years. At the time of admission the patient was catheterized, after which he developed symptoms of a periurethral abscess. This was incised and drained on two occasions, following which there was an extension of a fungating mass over the perineum back as far as the rectum. The patient died about three months after he was first seen. The tumor mass was removed *in toto* at autopsy, and the author presents a detailed description, both gross and microscopic.

In his discussion of the case the author brings out the fact that a large percentage of urethral carcinomas are of the squamous-celled type, in spite of the fact that they occur in a site normally lined by transitional epithelium. He stresses the importance of the development of leucoplakia found at cystoscopy.

In the treatment of this type of case he states that partial amputation of the penis may be indicated, or resection of the growth with end-to-end anastomosis may be done. He cites several cases of better than five-year cures. He believes that if the inguinal glands are not palpable, surgery is not indicated in that region. However, if they are involved, the best treatment is block dissection.

The prognosis in these cases is very poor. It may be that the condition is more common than we generally believe, and carcinoma should be suspected in any case of stricture demanding prolonged dilatation.

GILBERT C. THOMAS, M D

GENITAL ORGANS

Kraas, E.: Mistakes and Failures in Endo-Urethral Prostatic Resection (Fehler und Misserfolge bei der endourethralen Prostataresektion). *Ztschr. f. urol. Chir. u. Gynæk.*, 1936, 42 367.

If the usual great expectations from new therapeutic methods are not completely fulfilled, which result is hardly avoidable, it will react disparagingly upon the methods. Kraas fears the same experience for endo-urethral prostatic resection, and thinks that the critical urologist must decide whether

the method is an improvement or should be discarded. Kraas had occasion to consult numerous patients who had been resected endo urethral by other surgeons without relief of their distress. The failures were caused by faulty indications for operation and mistakes in its technique. Marked vascular dilation in the prostate constitutes a contraindication for resection because of the danger of hemorrhage during and after the operation. In such a case prostatectomy should be given the preference. Undoubtedly it is not always easy to recognize hypervascularization of the prostate. Soft consistency of the prostate, hypervascularity of the bladder neck mucosa, a hemorrhagic tendency during the examination and the patient's history may indicate that the condition is present. Kraas also mentions extensive intravascular hypertrophic lobulations as a faulty indication for resection. The surgeon performing a resection should strive for complete results in one sitting, i.e. the removal and prevention of residual urine and of the infection. The suggestion to resect as little tissue as possible is not followed. Very instructive clinical and operative histories are presented in cases that nevertheless are based upon faulty indication for resection. It is very important to cure the infection before operating. The more thoroughly the infection is removed pre-operatively the safer the resection. In the coagulation eschar, i.e. the tissue necrosis, the main site of the infection, and the colonization and the propagation of the bacteria will be found. Therefore as little coagulation as possible to obtain complete hemostasis should be done. In resections the source of the current is as important as the technical experience of the surgeon. Kraas describes in detail the application of the spark gap and tube apparatus for hemostasis; he prefers the former and for cutting under water the latter method. It is well worth the effort to construct current machines that remain dependable for superficial coagulation and at the same time are not limited in cutting operations. The spark gap apparatus answers all the requirements for coagulation. Kraas concludes that endo urethral resection will not be employed extensively in the future but after the general enthusiasm subsides it will be used by a limited number of surgeons who will eventually prove its value.

(JANSSEN) MATHIAS J. SEIFERT M.D.

MISCELLANEOUS

Desjardins A. U. Popp W. C. and Stuhler L. G.
Fever Therapy for Gonococcal Infection. *Med Clin North Am.* 1937 21 885

This report includes the results obtained from the inception of this work to July 1, 1936. From the very beginning the cases selected for treatment were chosen by the clinician and the urologist and the question of cure was decided by them after repeated negative smears and cultures.

When repeated smears and cultures showed that a patient was apparently cured, the authors never

theless insisted in every case on giving two additional sessions of treatment, in order to prevent any possibility of recurrence.

The technique employed has been criticized by some observers on the grounds that a cure requires too many sessions of treatment and that such an "excess" number of sessions is unnecessary. Most of the patients referred for treatment came from distances varying between 50 to 1,800 miles and they came in the expectation of being completely cured. Therefore it seemed essential to arrange the scheme of treatment so that an absolute cure could be assured to the large, possible number regardless of other considerations. When other workers can show equal or superior results, with a technique that involve fewer sessions of treatment, further technical modifications will be considered.

Between December 1, 1933 and July 1, 1936, 219 patients suffering from acute or chronic simple or complicated gonorrheal infection were referred for fever therapy. Of this number 41 patients did not complete their treatment, or the idea of treating them had to be abandoned for various reasons. Of the 169 patients who took the treatment faithfully, 152 were cured and have not had any further physical difficulties caused by the gonococcus. Seventeen patients were not completely cured but their condition improved to varying degrees.

Among the 169 patients who completed the course were 112 males and 57 females. Ninety seven were single and 72 were married. The average duration of the infection had been 7.3 months. One hundred and nine patients had contracted the infection for the first time, whereas 60 had contracted it for the second or third time.

Of the 152 patients who were treated successfully, only 31 had simple gonorrheal urethritis. In 121 the infection was associated with various complications.

In 127 of 152 cases from 1 to 4 sessions of treatment were sufficient to rid the patient of the infection. In 136 cases from 1 to 5 sessions were sufficient. In only 16 cases more than 5 sessions of treatment were required to eradicate the gonococcus.

At some stage of treatment varying degrees of nausea and vomiting were observed in 57 cases. Sometimes these occurred at the beginning of a session of treatment when the patient had disregarded the physician's warning not to eat before reporting for treatment. Usually however this complication developed at the end of a session or soon after its completion. An excessive quantity of water aside from it, all content might be responsible for the disturbance but this seemed a less likely cause than an excess of salt. This technical modification also will have to be tested for a much longer time before the relationship between the percentage of salt and the nausea and vomiting can be ascertained.

Headache is a frequent complaint of patients who receive fever therapy for any disease. It is especially common among patients with a condition that requires a high temperature for several hours for effective treatment.

Small, cutaneous vesicles were observed in 38 cases. They promptly responded to ordinary measures and had no particular significance.

Herpes of the lips and sometimes of the nose occurred in 13 cases. This complication usually developed after the first session of treatment in patients who admitted being susceptible to herpes. The lesions should be treated on general principles; they heal rapidly, and seldom interfere with the orderly sequence of the sessions of fever.

Tetany, usually affecting the hands and feet, was observed in 5 cases. In another case the tetanic manifestations did not affect the muscles of either the hands or feet, but those of the abdominal wall. In some cases the intramuscular injection of 10 c cm of calcium gluconate was sufficient to stop the disturbance. In other cases in which calcium gluconate was less effective, or ineffective, the inhalation of carbon dioxide promptly arrested the tetanic manifestations. In 5 other cases peculiar, incoördinate, muscular twitching was encountered. This resembled closely the muscular twitching of certain patients when their temperature rises above a certain level. The cause or causes of such twitching are not clear. In 3 cases a peculiar palsy of the peroneal nerve was observed, in 2 cases the palsy continued for one month, and in the third case for about five months. It then disappeared entirely. In all 3 cases the patients had received 10 or more

sessions of fever, and some of the sessions had been exceptionally long.

To say that fever therapy is entirely devoid of danger is contrary to fact. To date, the number of patients treated for various conditions has been 516, and these patients have received approximately 2,580 sessions of treatment. Of this number, 1 patient died under treatment. The patient was a young woman who had a pelvic infection. She had almost completed her first session of treatment, which had been entirely uneventful, when the pulse rate suddenly fell. She was immediately withdrawn from the chamber, restoratives, including carbon dioxide and oxygen, were administered; epinephrine was injected into the heart three times, but, although the heart began to beat after each injection, respiration failed to return. It is not clear what may have been the factor or factors responsible for her death. This patient's temperature had risen readily, and not the slightest difficulty had been encountered in maintaining it. At no time during the session had her temperature risen as high as 107° F. until just before the pulse collapsed.

This single death among the 516 patients treated gives a mortality of less than 0.2 per cent. However, this low mortality and the realization that death may occasionally occur from any method of treatment, offer no consolation for the loss of a patient.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

CONDITIONS OF THE BONES JOINTS MUSCLES, TENDONS ETC

Hirsch I S Generalized Osteochondrodystrophy
The Eccentrochondroplastic Form *J Bone &
Joint Surg* 1937 19 297

Hirsch endorses Jaffe's classification of the osteo-
chondrodystrophies as follows

A Localized osteochondrodystrophy

- 1 Limited to one epiphysis as Legg Perthes disease of the capital femoral epiphysis
- 2 Limited to one epiphyseal bone as Koehler's disease of the tarsal scaphoid
- 3 Limited to a few epiphyses or epiphyseal bones
 - a Involvement of both capital femoral epiphyses
 - b Involvement of more than one vertebral center
 - c Involvement of one or more epiphyses together with one or more epiphyseal bones

B Generalized osteochondrodystrophy

- 1 Leading to dwarfism because of failure of growth of the cartilages as achondroplasia
- 2 Leading to the appearance of osteochondromata at the metaphyses with distortion of the growth region of the bone as dyschondroplasia
- 3 Associated with irregular development of the epiphyses and epiphyseal structures as eccentrochondroplasia

The body of the article is devoted to an exposition of eccentrochondroplasia which is considered a clinical form of generalized osteochondrodystrophy distinct from achondroplasia and dyschondroplasia. Two Italian families were investigated by the author. Two siblings in a family of five were found in the first group; a mother and four of her six offspring including twin were in the second.

The most striking outward deformity is usually a thoracic kyphosis associated with marked prominence of the sternum. The head seems to rest on the thorax and the chin extends over the sternum. The pelvis tips forward and the hips backward. The flexed knees are in extreme genu valgum associated with flat feet. The hands have the trident form with short stubby fingers the relatively long arms emphasize the anthropoid appearance. There is apparent enlargement of the extremities at the joints and a peculiar laxity and hypermobility. The gait resembles the waddle associated with congenitally dislocated hips.

The roentgenogram shows a peculiar disturbance in epiphyseal ossification associated with a malacia which produces a definite deformity in the size and shape of the bone at the articulating ends particu-

larly. During the active or florid stage the cartilage plates are widened. Small nuclei of bone are found distributed irregularly through the cartilage. The fine points of ossification fuse later to give a ragged contour. The juxta epiphyseal ends of the diaphyses are irregularly flat or convex never concave. Changes are found in the hand wrist shoulder hip knee foot, and spine.

The disease is self limiting and in the healing stage the tendency to re-establishment of normal arrangement and form is marked. Although the nuclei consolidate and the margins become sharper a deformity developed in the stage of malacia is never overcome entirely.

Typical changes are shown in figures 2 9B 10 16 and 20
JEROME C FRYDER MD

Kling D H Juxta Articular Adiposis Dolorosa
Its Significance and Relation to Dercum's Disease and Osteoarthritis *Arch Surg* 1937 64 599

The term 'juxta articular adiposis dolorosa' is applied to tender subcutaneous accumulations of fat which are located near joints and regarded as the initial and intermediate stage of generalized adiposis dolorosa. The author interprets the condition as one of the soft tissue changes which leads to the development of osteoarthritis by interference with the blood supply by pressure and irritation of the structures of the joint and by interference with the function of the joint.

The report concerns the study of 122 patients who were observed during the past six years. Juxta articular adiposis dolorosa is most frequently present in obese multiparas past middle age. There were only three male patients in the entire series.

The most frequent sites for the painful fat pads are on the medial sides of the knees and elbows.

Systematic palpation is necessary for the discovery of this condition. A fold of skin and subcutaneous fat is elevated between the thumb and the other fingers and gentle pressure is applied. It is necessary to be on guard against hyper sensitivity of the skin and misunderstanding on the part of the patient. The elbow the patient's eyes are best covered and the sensitivity of the skin is tested previously.

Subcutaneous fat in different parts of the body and the joints is examined as a control. Juxta articular adiposis dolorosa is diagnosed only when there are centers of tenderness in the characteristic areas around the joints without changes in the more superficial or deeper structures.

The subjective symptoms are pain weakness and stiffness in the joints acroparesthesia and circulatory changes in the extremities.

Some frequently associated conditions are hypertension varicose veins depressed arches hyper-

cholesteremia, lowered basal metabolic rates, and hypofunction of the ovaries, thyroid, and pituitary glands. Hypercholesteremia was noted in 87 per cent and lowered basal metabolic rates in 33 per cent of the cases studied. In the majority of the cases the glandular disturbances were considered characteristic of chronic exhaustion rather than of acquired or congenital gross pathological processes.

Clinical and laboratory examination revealed slight or moderate osteoarthritis in about 60 per cent of the cases, and soft-tissue changes, such as hypertrophy of the infrapatellar fat pads, and periostitis, especially over the patella, or calcification of the insertions of the quadriceps tendon, were noted in 11 per cent. Joint effusions were present in 26 per cent.

Biopsies of the fat pads did not reveal definite pathological processes.

Permanent disappearance of the hypersensitivity and reduction of the fat followed excision in one case. All other therapeutic measures, including the administration of thyroid and ovarian preparations, bismamine cataploresis, and roentgen therapy, had only a partial and frequently transitory effect on the hypersensitivity of the fat pads.

These therapeutic measures were usually combined with a reducing diet.

ROBERT P. MONTGOMERY, M.D.

Fehr, A.: *Synovioma* (Sur Kenntnis der Synoviome). *Helvet med Acta*, 1936, 3: 844.

Synovioma was described for the first time by Lejars-Ruben-Duval in 1910. The name "synovioma" originated with the American author, Smith. Synoviomias are found in sarcomatous, spindle-celled basic tissue and are beset by roundish or slit-like cavities filled by a mucus-like substance. The tumor cells line the cavities in a palisade-like manner and have a cylindrical or cubical form. In individual cases giant cells and large round cells with fine-granulated oval nuclei, or mast cells, are distributed throughout the basic tissue, which is loosely constructed in some places and dense in others. The gland-like formations arise from the covering cells of the synovial tissues, which have retained their function of producing synovia even during the course of the malignant degenerative processes. Gradually the spindle-cell structure overgrows the others until finally an ordinary spindle-cell sarcoma with an origin no longer to be recognized is formed. As a rule the pulmonary metastases are a pure spindle-cell sarcoma. It is possible that this tumor form may be confused with adenocarcinoma of the breast or with hypernephroma. Atypically localized peripheral adamantinoma and mixed tumors of the salivary glands are suspected of belonging to the synovioma group in most cases. The author has observed four cases of synovioma, three of which terminated fatally in from three and a half to ten years. The remaining case was free of symptoms following removal of the tumor. One tumor originated in a bursa of the extensor tendons, two in other bursae,

and one was found to lie in the sulcus bicipitalis. (BURCKHARDT). JOHN W. BRENNAN, M.D.

Jensen, D. R.: *Ganglia and Synovial Cysts*. *Ann. Surg.*, 1937, 105: 592.

It has never been determined whether ganglia and synovial cysts are slightly different modifications of the same condition, and clinical distinction between the two is often impossible. Several different theories as to their causes are presented, and a comparatively new one, that they have their origin in embryological arrests in the process of the development of the particular tissue and synovial membrane, is restated. This theory was first presented by Floderus and supported by Kuettner and Hertel. The development of ganglia from remnants of ectopic synovial tissue and from highly differentiated embryological arrests would account for all the varieties that are seen. While the hygromas of bursae are very similar in pathogenesis and morphology, they differ from ganglia in that they have useful functions. Trauma apparently plays no part in the cause.

Pathologists now commonly agree that these cystomas are lined with mesothelium, the character of which seems to be the same whether present in ganglia, synovial cysts, or bursae.

An illustrative group of five case reports from a series of twenty-one instances of simple cystoma is presented. Except for the presence of the cyst these cases had few clinical symptoms to distinguish them. The age limit showed wide variation and the duration of the cyst varied from six months to two years. Treatment was sought because of the unsightly appearance and in a few instances because of fear of malignancy. Only two patients experienced slight pain on movement of the parts, one tumor was tender on pressure, and none of the patients in this group had limitation of motion. One tumor developed at the site of an incised wound two years after injury; but it would be difficult to conclude that this was the result of the original trauma. Cystomas are most frequently present in the region of the wrists; twenty in this series were so situated, while the other was on the left middle finger.

In a second group of twenty-three cases there were present, in addition to the cyst, signs of further involvement of the tissues which consisted of frequent pain and limitation of motion. The latter sign was present in varying degrees in all but one case. A "doughy feel" or crepitus of "rice bodies" has been described as being characteristic of a tuberculous process. In this group no such clinical sign was noted, yet a few of the patients presented a rather advanced tuberculous process with destruction of some of the structures when the tissue was examined. Therefore, it is important that the examiner does not wait for these signs before a clinical diagnosis of tuberculosis is made and radical measures instituted. The five cases reported in detail illustrate an advanced involvement of important structures without clinical evidence of a marked inflammatory process. Associated lesions in other parts of the

body are so infrequent as to be of little value in the diagnosis

Various types of treatment are discussed. In simple cystomas without pain or limitation of motion, complete dissection and removal of the sac is important. In cystomas with pain and limitation of motion early operation is indicated. All involved tissue should be completely and thoroughly excised and the incision closed without drainage. This method results in the highest percentage of cures although a certain percentage of failures occurs even after the most careful dissection.

ROBERT S. REICH, M.D.

Barr, J. S. Scleritis Caused by Intervertebral Disc Lesions. A Report of Forty Cases of Rupture of the Intervertebral Disc Occurring in the Low Lumbar Spine and Causing Pressure on the Cauda Equina. *J. Bone & Joint Surg.* 1937 19 393

The author reports forty verified cases of intervertebral disc lesions of the lower lumbar spine. The lesion produces a characteristic clinical syndrome. Sixty five per cent of the lesions occurred in the disc between the fourth and fifth lumbar vertebrae and 30 per cent in the lumbosacral disc. The ratio of males to females was almost 7:1 and trauma was a definite factor in 77.5 per cent of the cases. Some of the patients presented remissions and recurrences of increasing severity but 60 per cent were operated upon during the initial disabling attack.

Pain was the chief complaint. All of the patients having pain in the posterior and lateral thigh, 90 per cent in the posterolateral aspect of the calf, 70 per cent in the lumbosacral region, 65 per cent in the gluteal and sacroiliac region and 5 per cent in the lateral border of the foot. The type of pain varied in intensity and was often aggravated by coughing, sneezing and change of position.

At operation only one root was compressed by the ruptured disc fragment in more than half of the cases. In these there was no sensory loss because of the marked overlap in the sensory supply to the skin. In thirty four of the forty cases the referred pain was unilateral. Associated symptoms in some of the cases were numbness, muscle weakness, cramps in the calves of the legs and urinary and fecal incontinence.

Most of the patients had had previous orthopedic treatment with bed rest, heat, adhesive strapping, belts, corsets and braces.

In three cases known to the author paraplegia followed either manipulations.

One patient in this series had had a sacroiliac fusion and two division of the ischiofemoral band.

Twenty six of the patients had a listhesis scoliosis which was contralateral in some and homolateral in others. Twenty seven had a lumbar kyphosis. Back motion was markedly restricted. Thirty six patients had a restriction of motion in the straight leg raising test, worse on the affected side. Tenderness was present in the midline, the pos-

terior sacroiliac ligaments or the sacro-sciatic notch. The knee jerks were normal. In 50 per cent of the patients the ankle jerk was absent. Other symptoms noted were unsustained ankle clonus in one case, urinary and fecal incontinence in three cases, dribbling of the urine in two cases, loss of sexual potency in one case, muscle weakness in eight cases and sensory changes in seventeen cases.

Only 37.5 per cent of the flat roentgenograms showed narrowing of the disc, while thirty six of the thirty nine lipiodol examinations showed evidence of block or a filling defect. The examinations with lipiodol were 90 per cent accurate in localization in this series. Four and five tenths to five cubic centimeters of lipiodol were used. There were no untoward results.

A negative lumbar puncture does not rule out rupture of the disc. In five of the cases the total protein was normal from 20 to 40 mgm. per 100 c.c.m. while in thirty five cases it was above 45 mgm.

The operative technique as described by Elberg, Stoolky and Mixer consisted of laminectomy of from two to four laminae and spinous processes. When the lesion was definitely localized to one side a hemi laminectomy was done. In some cases a facet and a portion of the pedicle required excision. Sometimes the lesion was removed extradurally, although usually it was removed transdurally, the fibers of the cauda equina being carefully retracted. Before the dura was opened the head of the patient was raised to cause the lipiodol to fall into the sacral cul de sac. The dura was then opened, cotton pledgets placed in the upper end and most of the lipiodol removed with the suction apparatus.

Spinal fusion should be done if scoliosis or kyphosis is corrected. In twelve of the author's cases fusion was done immediately after the laminectomy. In some of the cases spinal fusion was done at a second operation. DANIEL H. LEVITZKY, M.D.

Williams, P. C. Lesions of the Lumbosacral Spine. I. Acute Traumatic Destruction of the Lumbosacral Intervertebral Disc. *J. Bone & Joint Surg.* 1937 19 343

From a study of 1,000 cases of chronic or recurring low back pain in which in the majority of the cases radiated down one extremity and occasionally down both extremities, the author is convinced that factors of injection and congestion play a secondary rôle and that the primary pathological change is a mechanically altered lumbosacral articulation resulting in most cases from changes in the intervertebral disc.

With destruction of the disc there is a settling of one vertebral body on the one below and an alteration of the facet relationship which result in degenerative arthritic changes. Compression of the nucleus pulposus may produce a herniation of the cartilaginous plates (Schmorl) or a rupture of the annulus fibrosus and result in a narrowing of the intervertebral space and constriction of the foramina.

Rupture of the nucleus pulposus is more likely to occur in young adult life than later, after chronic traumatic degenerative changes with fibrous-tissue replacement of the semigelatinous, normal fluid have taken place. Chronic trauma producing pathological changes in the annulus fibrosus is seen on the concave side of all spinal curvatures. Symptoms resulting from a lordosis are likely to be more severe because of the subluxation of the facets and the constriction of the foramina.

The disc between the fifth lumbar and first sacral vertebrae is subject to more trauma than any other, for it carries a heavier load and a greater lordosis. It is found destroyed more frequently than any other intervertebral disc. The next most frequently destroyed is the disc between the fourth and fifth lumbar vertebrae.

Williams has never seen a Schmorl herniation through the cartilaginous plates at the lumbosacral articulation. He believes that this herniation is due to the transmission of the weight through the posterior fibers of the annulus fibrosus, with posterior escape of the nuclear contents.

The clinical symptoms are due to subluxation of the facets which causes low back pain and irritation of the "funiculus" of the nerve which in turn causes "sciatica," a neuritis or neuralgia of the fifth lumbar nerve. The symptoms are due to the harrowing of the disc, the subluxation of the facets, and the hypertrophic degenerative changes.

The author found that 71.25 per cent of the 400 patients with lumbosacral disease had destruction of the lumbosacral intervertebral disc. The destruction of the disc may result from an acute injury or be due to chronic trauma.

The treatment consists of the application of a body cast while the patient stands with the spine flexed, his elbows resting on a table. The cast extends well down on the sacrum so that when he stands erect the lumbosacral lordosis is reduced.

Some patients continue ambulatory, but rest in bed for about ten days with the knees and hips flexed is prescribed for most cases. The cast is worn from one to two weeks. Occasionally another cast is applied. The cast is followed by a lordosis brace or an orthopedic corset. The brace is worn from six to twelve months. Postural instruction is given.

In the cases which do not respond to conservative treatment, surgery is indicated. Fusion and facetectomy are indicated for relief of the segmental symptoms.

DANIEL H. LEVINTHAL, M.D.

Badgley, C. E.: A Clinical and Roentgenological Study of Low Back Pain with Sciatic Radiation. Clinical Aspects. *Am. J. Roentgenol.*, 1937, 37, 454.

In recent years mechanical nerve irritation as demonstrated anatomically by Danforth and Wilson has attracted attention as a possible cause of low back pain with sciatic radiation. The importance of the lumbosacral joint in the development of this syndrome has been studied in 100 cases at the University Clinic at Ann Arbor.

This article is a report on the study of the clinical aspects of 447 cases with low-back-sciatic symptoms. The most characteristic symptoms are:

1. Pain in the sacro-iliac region radiating down deep in the posterolateral region of the thigh and into the peroneal distribution of the sciatic nerve. This pain may be constant or intermittent and may be brought on by a sudden unguarded movement. In none of the 447 cases was the pain felt in the mesial aspect of the leg and foot, and in only 11 it was present in the mesial aspect of the thigh.

2. Guarded motion of the spine is an early symptom.

3. The attitude of the patient. A list of the trunk was present in 39 per cent of the cases; it was away from the affected side in 125 cases, and toward it in 81 cases. When a list was not present, the patient often stood with very little weight on the painful leg and with the hip and knee slightly flexed.

Various signs aid in the diagnosis. Raising of the straight leg is limited, and may be due to contracture of the lumbopelvic muscles. Patrick's sign, forced abduction of the flexed thigh producing pain in the sacro-iliac region, is not commonly present. Hyperextension of the thigh with the knee flexed and the patient lying prone may produce pain in the lumbosacral joint. The "prone thrust" test may be conducted as follows: the patient lying prone is told to raise himself on his hands with elbows extended, and drop the pelvis down as far as possible toward the table. It is often impossible for him to do this because of pain in the lumbosacral region. Ober's sign may be seen when the patient attempts to adduct the extended abducted thigh with the knee at right angles while lying on his side. If the knee cannot be brought down to the table, the test is positive. This effect is caused by a contracture of the iliotibial band. Sensory disturbance, such as hyperesthesia or hypesthesia in the peroneal distribution, may be present. It was found in 20 per cent of the cases. Tenderness on pressure over the lumbosacral region, the posterior iliac spines, and sciatic notch is a frequent sign. Motor changes may be noted as a muscular weakness, or as a true paralysis. The former type was present in 12 cases; the latter in 2. Diminution in the Achilles reflex may be present, it was observed in 18 per cent of the cases. Atrophy may be noted in chronic cases.

The average age of the 447 patients was 49.7 years. There were 251 males and 196 females. Trauma was a definite factor in only 25 per cent. Only 15 were seen in their first attack, 230 in recurrent attacks, 108 with constant symptoms, and 92 with chronic symptoms associated with acute exacerbation. The symptoms were on the right in 147, on the left in 167, and bilateral in 133. The radiating pain was referred to the posterolateral aspect of the thigh, calf, and foot in the majority of the cases, although in a few there was pain in the iliac crest, anterolateral thigh, perineum, gluteal region, and adductor region. A careful study of the distribution of the pain leads the author to believe that it is not in the regions of

the sciatic nerve endings but in the postaxial distribution of the lumbosacral plexus. Comparisons of the clinical findings with the roentgen ray findings show that the symptomatology is the same whether the roentgenogram shows any kind of abnormality or not.

A tabulation of results indicates that the type of skeletal change observed in the roentgenogram has no definite control over the extent and location of the radiation of pain. The sensory disturbances were more frequent in the group with abnormal roentgenograms. In the few cases with loss or diminution of the Achilles reflex most of the abnormalities were demonstrable with the roentgen rays particularly a reduced lumbosacral space. This narrow lumbosacral space which was found in 57 per cent of the cases is generally regarded as a significant factor in the production of the syndrome.

WM. ARTHUR CLARK, M.D.

Hodges F J and Peck W S. A Clinical and Roentgenological Study of Low Back Pain with Sciatic Radiation. Roentgenological Aspects. *Am J Roentgenol* 1937 37 461

This paper is based on a roentgen study of 447 dorsal, lumbar and sacral spines in patients with low back symptoms and sciatic radiation. When the antero posterior views were taken the lumbar curve was straightened as much as possible by having the patient flex the hips and knees. For lateral views a pad was always placed under the flank to prevent lateral sagging of the lumbar spine. The average age of the patients was about thirty eight years. A group of 538 patients without radiating sciatic pain was used as a control. A lumbosacral joint space was recorded as 'narrow' only when it was no more than half of the thickness of the joint space which was just above it.

In the group studied 57 per cent of the patients had a narrow lumbosacral joint space. In the control group the percentage was 12.8 per cent. Twenty seven per cent of the patients in the group had lumbosacral anomalies such as sacralization lumbarization butterfly type of transverse processes and spina bifida and 23.7 per cent showed osteoarthritic changes. The percentages in the control groups were 14.3 and 2.8 respectively.

The anomalies were listed as sacralization 6.7 per cent lumbarization 3 per cent butterfly transverse processes 2.5 per cent spina bifida 10.8 per cent and spondylolisthesis 8.1 per cent.

In the discussion of this article it was brought out that the roentgen ray findings such as anatomical variations are not always the cause of the aching and sciatic radiation. Surgical correction of such anomalies is sometimes disappointing. It is also mentioned that the normal average width of the lumbosacral joint is about 14 mm. while the width of the one just above is 7 mm. Therefore the criterion of one half is too conservative in reporting a narrowing of the lumbosacral joint.

WM. ARTHUR CLARK, M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC

Forrester Brown M. Arthrodesis in Young Children. *Proc Roy Soc Med Lond* 1937 30 431

The author sets forth reasons dissipating certain misapprehensions concerning the bone forming powers of cartilage in quite young children. He shows that cartilage produces excellent bone. It must be remembered that poor results from arthrodesis occur in older patients also because the indications are made for arthrodesis in patients who tend to be poor bone formers such as patients with tuberculous polyomyelitis and congenital bone defects. These conditions also tend when severe to impair the growth of epiphyses spontaneously, the arthrodesis must not be blamed. The danger of relapse in a deformity from bending of the soft bone is no greater after arthrodesis than before it must be prevented by adequate and prolonged splinting. The correction obtained by arthrodesis helps restore the normal growth lines and prevents development of complicated secondary compensatory deformities. Children of four years and over are acceptable for surgery.

The indications for early arthrodesis are made in polyomyelitis such conditions as flail foot calcaneocavus thenar paralysis and flail shoulder in cases of absent radius or fibula, congenital equinovarus and tuberculous knee or ankle. The technique is simple only a few points are stressed. In polyomyelitis it is necessary only to slice away the articular cartilage from the surface of the bones and leave the growing cartilage of two bones in contact. An anchoring stitch of strong catgut reduces the possibility of displacement. A strong amputation knife is preferred to an osteotome for trimming. The author describes his methods of treating calcaneovalgus absent radius and absent fibula. In tuberculosis no attempt is made to get a clean resection of the whole tuberculous area but merely a sawing of the articular surfaces is effected.

JEROME G. FRYDEN, M.D.

FRACTURES AND DISLOCATIONS

Faltrieri M. Rotary Dislocation of the Atlas (Lussazione rotatoria dell'atlante). *Chir d organs di movimento* 1937 22 457

At the Istituto Rizzoli Bologna there has been only one case of uncomplicated rotary dislocation of the atlas among 368 fractures of the vertebrae. The patient was a boy fifteen years of age who five and a half months previously slipped on the floor and struck the left mastoid region. The subjective symptoms consisted of pain radiating to the left side of the occiput. The physical signs and the roentgenograms were characteristic. Especially interesting was the contracture of the right trapezius muscle. Faltrieri ascribes the absence of medullary symptoms to the fact that the cord in this region can tolerate some diminution of its transverse diameter.

without disturbance, whereas even a slight reduction of the anteroposterior diameter is fatal. Evidently there was an incomplete laceration of the ligaments on the left, while the ligaments on the right were under only slight tension, otherwise the dislocation of the atlas would have been greater and the cord would probably have been compressed. The prognosis was considered good because of the length of time since the accident, the incompleteness of the lesion, and the partial preservation of the ligaments, which would prevent further slipping. Reduction was not attempted, but traction in extension was applied to the head for three days, after which a plaster-of-Paris collar was worn for three months, and physio-therapy then begun.

The literature on rotary dislocation of the atlas is scarce and not all the cases are well reported. The author gives a historical review of the subject, and discusses the mechanism and the physical and radiological diagnosis of the lesion.

The article is accompanied by references, photographs, roentgenograms, and anatomical diagrams.

M E MORSE, M D

Roberts, S M.: Fractures and Dislocations of the Cervical Spine. Dislocations, Complications, and Operative Treatment. *J Bone & Joint Surg*, 1937, 19 477

Complete dislocation between the atlas and axis occurs without fracture because the articular facets are nearly horizontal, there is no spinous ligament attachment, and sheering and twisting forces have no bone resistance except the odontoid. Complete dislocation in the lower cervical spine rarely occurs without a fracture. Unilateral dislocation in the lower cervical spine occurs without fracture. In 10 of the 19 cases of dislocation presented, demonstrable fractures accompanied the other injuries. Dislocation occurred most frequently between the fourth and fifth vertebrae, and next frequently between the first and second. The younger the patient, the higher in the cervical spine the dislocation occurred.

Injuries that produce dislocations are usually severe. The head assumes positions similar to those in a torticollis in unilateral dislocations. "If there is a complete dislocation on the right, the head will be turned to the left and tilted to the right. In cases of bilateral complete dislocation, the head is tipped forward without rotation." Roentgenograms are necessary for the differentiation between fractures and dislocations.

The sooner reduction is attempted, the greater the chance for success. The author believes that an attempt at correction, in the upper cervical spine at least, should be made even after ten months if there is a permanent deformity of the neck.

Fatal cord injuries seldom accompany a dislocation, even if the dislocation is complete. Fractures are more serious than dislocations, and are more likely to be fatal or to be accompanied by irreparable cord or nerve damage. From a series of 37 cases, all of the 12 cases of compression fractures showed some

sort of nerve-tissue involvement, only 7 of the 19 cases of dislocation showed nerve symptoms.

Reduction of a dislocation in the cervical spine is not dangerous. When a compression fracture of the body is present in addition to the dislocation, an attempt at reduction of the dislocation is dangerous. It is better to treat the fracture and allow the dislocation to remain untreated.

In incomplete dislocations, reduction can be obtained by hyperextension and traction alone. When dislocation is complete, reduction must be attempted only under general anesthesia. Traction in complete dislocations is futile; manipulation is necessary. Forward flexion of the neck must be prevented at all times.

The method of reduction used by the author is that described by Walton (*Ann. Surg.*, 1904, p 654).

Following the reduction of a complete dislocation the spine should be held by a plaster jacket for two months, by a leather collar for two months, and finally by a Thomas collar for two months. In incomplete dislocations, the plaster jacket is not used.

Late complications are due to a gradual increase in the scar tissue and bone callus. Irritation of the unhealed injured parts by strain following a too early release of the fixation increases the scar tissue and callus. Re-dislocations occasionally occur when the cervical spine has not been protected long enough. Active exercises are begun eight weeks after the reduction. All exercises should be done in a recumbent position for the first two or three weeks, and they should be designed to teach the patient to hold his head up and his chin in, in the correct mechanical position. "It is extremely important that the transition from complete fixation to complete freedom should be gradual and accompanied by active muscle training."

Operation is rarely indicated except for relief of late symptoms of the cord. If a spinal-fluid block is present after reduction of the dislocation in early cases, a laminectomy is indicated. Symptoms of the cord that arise as a late complication are more likely to disappear after laminectomy than the early symptoms.

ROBERT P. MONTGOMERY, M D.

Betto, O.: Isolated Fractures of the First Rib (Le fratture isolate della prima costa). *Chir. d. organi di movimento*, 1937, 22 424.

Betto reports a unique case of isolated and symmetrical fractures of the first ribs due to compression of the upper part of the thorax between two automobiles. The patient was a man, forty-two years old. The breaks occurred between the middle and anterior thirds, and were clean-cut, the fragments were not displaced. The immediate manifestations were violent pain in the neck, dyspnea, and supraclavicular subcutaneous emphysema. He was treated by strapping. Eighteen months later, he was without symptoms; and palpation, auscultation, and the respiratory excursions were normal. The upper part of the sternum protruded; callus formation was slight, and on the right appeared a pseudarthrosis

Fracture of the first rib by direct force on the rib itself without intervention of the clavicle and excluding gunshot wounds are almost unknown. In the second variety of direct fractures of the first rib fracture of the clavicle is the preponderant factor as the fragments cut into the costal arch. This lesion is grave and is complicated with injuries of the blood vessels. In indirect isolated fractures of the first rib the clavicle is an important but not indispensable factor acting concomitantly with other factors. Trauma is not always present, it merely serves to favor muscular contraction which plays the essential rôle. Of chief importance is the scalenus anticus muscle which acts in conjunction with other factors particularly fixation of the thorax in inspiration and in some cases a zone of least resistance in the costal arch. The trauma usually involves the deltoid and the supraclavicular and infraclavicular regions, the force being transmitted to the clavicle and thence to the rib. As a result the middle third of the costal arch is lowered and its curvature is in-

creased. Simultaneously the scalenus anticus muscle contracts violently raising and fixing the rib and also increasing its curvature. A rigid system is formed, composed of the transverse vertebral process, the costal arch and the sternum. The clavicle and the scalenus muscle always act together. A forward and upward movement of the shoulder, an instinctive attempt to protect the head, is very important because it carries the clavicle with it and thus helps to fix the thorax.

In the present case the line of force passed antero-posteriorly from the sternum to the spinous processes of the first two dorsal vertebrae as evidenced by ecchymoses accentuated the curvature of the costal arch and tended to rotate the rib in the direction of its margins. The perfect symmetry of the fractures on the two sides shows the existence of a weak point at the junction of the middle and anterior thirds.

The article is accompanied by roentgenograms, photograph, anatomical drawings, and a bibliography.

M. E. MOSE, M.D.

SURGERY OF THE BLOOD AND LYMPH SYSTEMS

BLOOD VESSELS

Fontaine, R. and Pereira, S : *Experimental Obliterations and Resections of the Veins Contribution to a Study of the Collateral Venous Circulation* (Oblitérations et résections veineuses expérimentales Contribution à l'étude de la circulation collatérale veineuse). *Rev. de chir.*, Par, 1937, 56 161.

It is a generally accepted idea that obliteration of a vein causes edema, although a number of authors have reported experimental work showing that such is not the case. Fontaine and Pereira report experiments on dogs made for the purpose of studying this question. They made thirty-three experiments on twenty-nine dogs, which may be divided into five groups: (1) resection and obliteration of the superficial femoral vein and its tributaries, (2) resection and obliteration of the common femoral vein, corresponding to the common iliac vein in man, and its tributaries, (3) resection and obliteration of the inferior vena cava and its tributaries, (4) circular ligation of all the veins at the root of the thigh; and (5) resection or obliteration of veins associated with obliteration of the lymphatics. These experiments are described in detail and illustrated with phlebograms.

The authors conclude that resection or obliteration of a short segment of the superficial femoral vein does not cause any perceptible interference with circulation. If the superficial femoral vein was obliterated for the whole length of the thigh and, in addition, the internal saphenous was obliterated, an edema developed which lasted for a few days and then disappeared without leaving any traces.

There did not seem to be any difference in the effects of obliteration of the vein with chemicals from those with resection.

The resection or obliteration of a short segment of the common femoral where it emptied into the inferior vena cava did not have any evident effect on the circulation. If the vein was resected down to Poupart's ligament with ligation of the deep femoral vein and obliteration of the superficial femoral and internal saphenous veins, it caused a marked but transitory edema, which lasted from a few days to two or three weeks.

Circulation was re-established in these cases by two collateral systems, a deep one which established communication between the veins of the lower limb and those of the sacral system and through these with the sacro-iliac trunk and the common femoral vein of the opposite side, and a subcutaneous network which appeared on the external part of the thigh and anastomosed freely with the veins of the abdominal wall and the system of the superior vena cava.

If the common femoral vein of the opposite side was obliterated at the same time, the external

collateral network developed still more, while the deep network was less apparent. The external collaterals were sufficient to restore a perfect return circulation. In case of simultaneous obliteration of the superficial vein, a network of collaterals developed in the muscles of the thigh.

Resection of the origin of the inferior vena cava resulted in a temporary edema which could be prolonged to as long as twenty-nine days by adding obliteration of the superficial and common femoral veins and the internal saphenous vein. No matter how great the obstacles, except in one case in which an enormous edema caused ulcers and rapidly fatal infection, there were never any other sequelæ at the end of several weeks than a few dilated prepubic veins. Circulation was re-established by the two collateral systems described. The external network became more important than the internal, which had lost its two chief collectors, the sacro-iliac trunk and the common femoral vein of the opposite side, and was limited to anastomoses with the intestinal and prevertebral veins.

When successive phlebograms were made at intervals of several months the collaterals were seen to develop very quickly, later they did not increase in number very much, but increased greatly in size.

It seemed impossible in the dog, therefore, to interfere seriously with the return circulation either by chemical obliteration or resection of the veins. The only way to do this was by sectioning all the veins at the root of the thigh by a technique which the authors describe. In this way they caused enormous edema with moist gangrene which caused death in two cases.

Resection or obliteration of the lymphatic trunks of a limb in the dog caused an edema which lasted from eight to nine days; it had all the characteristics of an edema of venous origin. If both veins and lymphatics were obliterated it seemed to prolong postoperative edema but did not make it permanent.

The authors then attempt to relate the results of their experiments pertaining to the pathology of clinical phlebitis. As it was necessary practically to abolish the venous and lymphatic circulation entirely in order to cause more than a transitory edema, they concluded that neither the mechanical factor nor the lymphatic factor completely explains the development of phlebotic and postphlebotic edema. They agree with Leriche that venous spasm plays an important part in the pathogenesis of phlebotic edema in man.

AUDREY GOSS MORGAN, M D.

Linton, R. R.: *Acute Peripheral Arterial Occlusion and Its Treatment*. *New England J. Med.*, 1937, 216 871.

In reviewing the history of the treatment of acute peripheral arterial occlusion the author notes that

the percentage of extremities saved by embolectomy is still relatively low. Of 282 embolectomies reported in the literature 85 or 30 per cent produced successful results. He discusses the present methods of treatment and presents data drawn from a study of 44 cases of acute peripheral arterial occlusion occurring in 36 patients treated at the Massachusetts General Hospital from 1929 to 1936. Successful treatment of acute arterial peripheral occlusion depends on early diagnosis and immediate proper treatment. This condition is truly an emergency in every sense of the word.

Sixty seven per cent of the patient studied gave a history of sudden severe excruciating pain in the affected limb when occlusion occurred. It is generally thought that the most characteristic symptom is the attack of pain. These data reveal that embolism cannot be ruled out because of the absence of sudden excruciating pain. Other more constant symptoms are numbness of the involved extremity, paralysis of the more distal groups of muscles in the affected limb and coldness of the skin. The objective signs are pallor, a decrease in the skin temperature, complete or partial anesthesia, absent skin and tendon reflexes and lack of pulsations in the arteries peripheral to the site of embolism.

Inasmuch as an arterial embolus almost always lodges at one of the major bifurcations of the arterial tree, localization can be done by careful palpation to determine where the pulsations cease. If as in an obese patient, there is difficulty in locating the site, it may be determined accurately by means of the ordinary sphygmomanometer.

There are four main types of treatment, viz. embolectomy, the use of intermittent negative and positive pressures, the use of vasodilators and symptomatic or watchful waiting. The author presents a detailed discussion of these methods as applied in the cases he is presenting.

Embolectomy was done in twelve cases. Four or 33 per cent of the extremities in this group were saved. To be successful the operation should be done at the earliest possible moment after the embolism occurs, preferably within six hours. The most favorable results are to be expected in patients under fifty years of age because the arteries are not so apt to be calcified.

Fifteen patients were treated with the negative positive pressure apparatus of Pavaux or with intermittent negative pressure. In this group nine extremities or 60 per cent were saved. This represents the highest percentage which was reported as saved by any one method of treatment. Most of the patients in this group were not suitable for embolectomy. Younger patients developed an adequate collateral circulation more rapidly than the older ones. This form of treatment is especially adapted to patients whose condition does not warrant operation. It is recommended to be used following embolectomy.

No use was made of vasodilators in this group. One group of seventeen patients received sympto-

matic treatment. Five of the extremities did not develop gangrene. Four of the five patients had emboli in the arm. It is noted that adequate collateral circulation develops spontaneously very frequently in embolism of the upper extremity. Excluding these four patients, there remained thirteen of which only one or 8 per cent was saved. There is nothing to recommend the method of symptomatic treatment of peripheral embolism.

The author concludes that the ideal method of treatment for suitable cases is a combination of treatments, namely, embolectomy followed by use of the pressure treatment and the production of peripheral vasodilation. Early diagnosis and immediate treatment are indispensable to a successful outcome.

HARVEY F. THURGOOD, M.D.

Laewen. A. Thrombectomy in Venous Thrombosis and Arteriospasm. (Ueber Thrombectomie bei Venenthrombose und Arteriospasmus.) *ds. Tag. d. deutsch. Ges. f. Chir.* Berlin 1935.

In a case of thrombosis of acute onset of the right subclavian and axillary veins in a forty nine year old man, the two veins were exposed and all of the thrombi removed from them. A copious bleeding from the peripheries resulted. Both of the phlebotomy wounds were closed with continuous silk sutures. The swelling receded abruptly immediately after the operation. The circulation in the whole of the right arm became better, there was prompt and considerable improvement in the venous stasis, the purplish discoloration of the skin disappeared, the skin temperature increased and the pulse in the right radial artery, which had previously been weak, became as strong as that on the other side. The severe pains in the right arm disappeared on the day of the operation and did not return. The patient felt completely well and was able to return to work.

Two explanations may be given for the immediate favorable effect of the operative removal of the masses of thrombi. Either an irritation acting on the intima and exerting a spastic effect or the corresponding arterial region was removed with the thrombi or more probably a natural circulation was re-established in the previously thrombosed veins. Operative removal of bland thrombi from the veins has been considered many times but almost never has been carried out. Kulenkampf in 1927 fully removed a thrombus from the saphenous vein in three cases and believed that by removal of the thrombi he protected the patients against pulmonary embolism. At the end of 1936 the author performed thrombectomy on a vein in two other very unfavorable cases without success, but with further technical development of the operation. In both cases there were massive thromboses of the femoral and external iliac veins. The external iliac vein was temporarily ligated above the thrombus with a tampon. Then a longitudinal incision was made in the anterior wall of the femoral vein under Poupart's ligament and the thrombus masses were

removed. The wound in the vein was closed with a continuous suture. The temporary upper ligature of the vein was removed. In the first case, the swelling in the extremity, which was afflicted with total motor paralysis, did not recede after the operation. Autopsy, twenty-five days subsequent to the operation on the vein, showed diffuse ascending thrombosis of the veins of the right leg. In that portion of the vein from which the thrombus had been removed, a fresh thrombus had formed. The lung was wholly unaffected. In the second case, in which there was also an arteriospasm in the region of the femur, the entire thrombus was successfully removed, but the patient, who suffered from a severe cardiac insufficiency, died at the close of the operation. Here, too, the lung was free of infarcts. In this case the author's "thrombus curette" proved well adapted to its purpose.

Before thrombectomy is undertaken it must be certain that a thrombus is present and there must be no question as to its site. The most promising cases would seem to be those in which it is possible to remove the thrombus in its entire extent. In these cases there will also be the least danger of recurrence. The treatment of bland venous thrombosis remains conservative. Phlebectomy need be considered for only specially selected cases, for which the technique described is recommended.

In the discussion, FRUEND said that mass embolisms cause immediate death, or the patients survive the first shock only to succumb, in almost all cases, to a second embolism. The speaker was the first to remove the secondarily forming thrombus and ligate the thrombus-containing vessels and thereby prevent a second embolism. In the first case operation had been done three years before. The thrombus, which was of the size of a thumb and had grown into the femoral vein from the saphenous vein, was removed through a longitudinal incision in the femoral vein. Cure followed. In the second case there was a slowly ascending thrombus of the femoral vein with high-grade mass embolism. The thrombosed femoral vein was opened at the level of Poupart's ligament and a thrombus as thick as a thumb and 15 cm. in length was removed from the iliac vein. The femoral vein was ligated, and cure followed. In the third case there was a very rapidly progressing thrombosis of the femoral vein with very severe mass embolism. The femoral vein was exposed and a thrombus 18 cm. long was removed from the iliac vein. The femoral vein was ligated and cure resulted.

The operation is easy, no patient is so sick that he cannot undergo it, and any surgeon can perform it.

As more than 90 per cent of all mass emboli originate in the femoral vein, the operation is given added importance. It is wholly safe, because of the positive pressure present in the femoral vein, which always drives the thrombus in the direction of least resistance when the vessel is opened. There is therefore no danger that another embolus will be torn loose during manipulation of the thrombus after the vessel has been widely opened.

FLORENCE A. CARPENTER.

Westerborn, A.: The Danger of Embolism in the Treatment of Varices with Injections, and a Report on Embolism Occurring in Sweden (Ueber die Emboliegefahr bei Injektionsbehandlung von Varizen nebst einem Bericht ueber die in Schweden vorgekommenen Emboliefaelle) *Acta chirurg. Scand.*, 1937, 79: 321.

The mortality of pulmonary embolism in Sweden from treating varices was 0.26 per cent after operation, or 18 of 6,994 patients operated upon in the period from 1921 to 1925. After injection and ligation the mortality was 0.33 per cent, or 4 of 1,200 patients treated in this manner in the period from 1928 to 1934. The mortality following the injection treatment amounted to 0.036 per cent, or 11 of 30,000 patients treated by injections in the period from 1927 to 1934.

Operation, and injection with ligation have resulted in about the same mortality, the latter method having a slightly higher rate. This rate is about ten times as great as that following treatment by injection alone.

Rest in bed and infection are the main causes of embolism, these factors explain nearly all of the cases of embolism from treatment of the infection alone. If these two factors are eliminated, the rate of embolism will fall and the harmlessness of treatment by injection will be still more in evidence.

The substance injected seems of no importance in so far as embolism is concerned. The agents most frequently used have caused embolism. Sixteen of 53 cases of embolism from injection treatment were caused by quinine-urethan, 12 by sodium chloride, 9 by sugar solutions, and 8 by sodium salicylate.

Thirteen of the 16 caused by quinine-urethan occurred in Sweden. Quinine-urethan is still used a great deal in Sweden, but in other countries it is not as popular as formerly. Sugar and sodium-chloride solutions are more commonly used at the present time. A new agent which is becoming more popular at this time is sodium morrhuate. The author has had his best results from the use of this substance.

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE POSTOPERATIVE TREATMENT

Brown J B Homografting of Skin With a Report of Success in Identical Twins *Surgery* 1937 1 553

It has been found generally that skin transplanted from one individual to another does not survive permanently. The usual course is that following a possible 'take' of the graft there is a survival for two weeks but total absorption of the graft takes place by the end of the third week. This has been followed by a period of granulation and then spontaneous epithelization, which is perhaps somewhat rapid and in some instances has been mistaken for transplanted skin.

Suggestions have been made to insure permanence of these grafts the best known of which is that the donor and recipient should be of the same blood group but there is no measurable value of this selection of donor skin either in the 'take' of the graft or its survival.

The solution of this problem would be one of the major advances in reconstructive surgery but for the present the patient's own skin must be used.

In two instances the author used homografts from the mother to tide over very serious periods in the care of patients whose conditions might otherwise have proved fatal and in both instances it was thought that the two week respite afforded by the open wound was the turning point in the condition.

In one case of a deep burn which extended very close to the peritoneum the general health failed so badly that it was feared the patient would not survive. As a last resort to provide a covering for the wound thick split homografts from the mother were applied to the entire area to remain in place for as long as they might last. There was immediate local and general improvement the grafts took almost perfectly and for two weeks while the grafts survived the child was comfortable. By the end of the third week the grafts were completely absorbed but the wound was much improved and the patient was comfortable. There was apparently a real stimulus to spontaneous epithelization and the area was rapidly covered over.

The author never encountered a burned patient with a twin but after finding suitable twin brothers he transferred full thickness skin grafts from the arm of one twin to that of the other and obtained primary healing in both with complete and permanent survival of both grafts.

De Snoo K. Thrombosis and Embolism (*Thrombose und Embolie*) *Geneesk Tijdschr Nederl* Indië 1936, p 3874

Thrombosis is a physiological process which prevents bleeding to death after an injury of the

blood vessels. Generally it is limited to the place of injury. It is only when it spreads beyond this region that it becomes pathological and is considered clinically. On the basis of 38 post mortem reports two main groups of thrombosis are distinguished: wall thrombosis and central thrombosis. Wall thrombosis develops in the operative region as in the uterus or as a telethrombus on the basis of a phlebitis. It is, therefore, of infectious origin. Central thrombosis is a loose cylindrical formation in the lumen, cloaked with blood, which originated in a small injury or infection of the wall of a blood vessel or in a thrombus protruding from an accessory branch into the venous lumen. Such a central thrombosis can also join a preexisting wall thrombosis when the latter has reached the large accessory branch. The author then speaks of a secondary central thrombosis. Clinically it is possible to distinguish these three forms quite clearly. In wall thrombosis there are fever and similar infectious symptoms and pale, pasty swelling of the leg. The vascular cord under Poupart's ligament is painful for some time and there is softening of the thrombus with chills and pyemia. In primary central thrombosis there is a sudden stasis in the leg which turns white not blue. There is a scarcity of general symptoms but danger of loosening of the thrombus with fatal pulmonary embolism. The emboli are firm and do not break. In secondary central thrombosis there are septic symptoms with small pulmonary emboli and infarct and abscess formations which appear multiple. The thrombus is infected and brittle. There is no doubt that the first and third forms are of infectious nature and that the real problems of thrombosis are centered in the second group: the primary central thrombosis.

Regarding the danger of embolism it is clear that any motion and every increase of pressure tends to break the thin accessory ligament. In order to avoid this danger absolute rest is necessary. Past experience shows that the fatal emboli appear in the second and third week after operation or delivery. As a prophylactic measure the author insisted that his patients remain flat in bed with the result that in 875 gynecological laparotomies only one patient died from embolism. We cannot prevent thrombosis but the author believes that the problem of embolism is practically solved if the patients are induced to exercise patience and the physicians no longer allow competitive considerations to shorten the period of after treatment.

It is well known that anemic and older patients and especially those who are feverish before delivery or operation are more exposed to the danger of thrombosis. It is also known that most cases of thrombosis appear, especially after a laparotomy in the lower abdomen. In regard to thrombosis in gynecological laparotomy the author found prac

tically no difference between simple ovariectomy, and operations for myoma or carcinoma, and operations in inflammatory diseases. It became manifest, however, that before the appearance of thrombosis, all patients had a rise in temperature, and of 36 women who developed thrombosis after a perfectly normal delivery, only 2 remained free from fever. Moreover, it was demonstrated that (1) cases of thrombosis appear in groups and each group has its own characteristics; (2) there is a period of incubation of from one to two weeks following delivery or operation; (3) women who repeatedly became sick during the puerperium who were received from outside into the section for infectious diseases, where also the thrombosis patients were cared for, likewise developed thrombosis in the course of from one to two weeks, (4) the danger of thrombosis after a perfectly normal delivery in the clinic is four times greater (16 per cent) than in the patient's own home (4 per cent). All this leads to the conclusion that infection is also the real cause of primary central thrombosis.

To counteract thrombosis, it was necessary to isolate the patients with thrombosis and keep the pregnant and healthy women sharply separated from the sick puerperal women and to observe the strictest precautions against infection. In line with these precautions, the Utrecht clinic has been completely rebuilt. The large halls have been divided into small rooms with 3 or 4 beds, with a quarantine section with individual compartments for suspected and definite cases of thrombosis and a section with compartments for infected cases and isolated nursing care for the sick patients and the patients with thrombosis.

Prophylactic treatment by motion is rejected (1) because of the danger that an unrecognized central thrombosis may break loose, (2) because through motion the speed of the blood current in the large vessels may undergo still more pronounced fluctuations than normal without preventing a deposition of new thrombocytes with fibrin on both ends of the central thrombosis where rotary motion always takes place, (3) because among thousands of afebrile puerperal women who for nine days remained lying flat in bed and who had been looked after with the greatest care, only two developed thrombosis.

According to the author the first mistake made in the treatment of thrombosis was when the patient was allowed to get up early in the puerperium. In reality, these two factors are unrelated. Is it not a fact that patients are allowed to leave their beds on the ninth day, the day when the danger of embolism begins? Women with a normal puerperium do not develop thrombosis, whether they remain lying flat or whether they get up and engage in gymnastics. Only when the blood is thrombophilic or when a phlebitis exists, is it possible for a thrombus to develop, and in that case any motion is harmful.

CLARENCE C REED, M D

ANTISEPTIC SURGERY; TREATMENT OF WOUNDS AND INFECTIONS

Bettman, A. G.: *The Tannic-Acid-Silver-Nitrate Treatment of Burns. J. Am. M. Ass.*, 1937, 108 1490

A new conception of burns has been brought about as a result of their treatment with tannic acid and silver nitrate. This treatment appears to change the lesion into one comparable to a surgical wound. It is this change that makes the application of tannic acid and silver nitrate superior to any other treatment from many different points of view:

1. More lives would be lost through the slower method of tanning.

2. The immediate stopping of the loss of body fluids prevents the consequent concentration of the blood.

3. Shock is prevented immediately, or it is very definitely minimized.

4. The absorption of toxic products is prevented immediately.

5. Infection is prevented by the short period of application of moisture and the early drying of the tanned tissues.

6. The kidneys and other organs are saved from the effects of fluid concentration and the absorption of toxins and infection.

7. The patient is placed in greater comfort than by any other procedure.

8. The patient is carried safely past the first twenty-four hours, the most critical period following a serious burn.

9. The patient avoids the second critical period, that of infection and late absorption of toxic products.

10. The nursing problem is simplified, especially in the first twenty-four hours.

11. Further break-down of tissues, resulting from long application of wet dressings, is prevented.

12. Chilling, resulting from the long application of cold, wet dressings, is prevented.

13. A thin, flexible coagulum is formed.

14. Rapid healing of the burned areas takes place, with a shortened period of hospitalization.

15. The formation of heavy contracting scars by early rapid healing in the absence of infection is prevented or decreased.

16. Less skin grafting and secondary corrective surgery are necessary.

In July, 1934, the author first used tannic acid and silver nitrate on an extensive burn. The treatment is carried out as follows:

The patient is given a narcotic, which is repeated as often as may be necessary for comfort. Fluids must be forced throughout. Grease and oil in any form should not be used. If such an application, unfortunately, has been made, it must be removed with ether, benzene, or ethyl acetate before treatment is applied. All blebs must be opened and all loose skin and other burned tissues removed. A thorough application of fresh 5 per cent tannic-acid solution is

made by means of cotton swabs. Following this, 10 per cent silver nitrate solution is applied in the same manner.

The local treatment now being completed, the patient is placed in a tent heated by electric light bulb and the burned areas are dried and kept dry. In a few days the coagulum begins to loosen and is removed as early as possible. When it comes away large areas and not infrequently all the burned surfaces will be found to be entirely healed. Occasionally moisture will be hidden beneath crusts where drying has not been satisfactorily accomplished, and such areas are unhealed. When the coagulum is adherent but loose it is removed with a scalpel being used if necessary. Unhealed areas are treated by the application of oxyquinoline sulfate scarlet R gauze to a single layer, over which a light pad of dry gauze is placed and healing is greatly speeded up.

STANLEY J. SEEGER, M.D.

Kuemmel H. and Jensen W. Contributions to the Mechanism of Action of Cod Liver Oil Wound Dressings (Beiträge zum Wirkungsmechanismus des Lebertranwundverbandes). *Deutsche Zeitschr. f. Chir.* 1936 248 238.

The authors recognize the advantages of unguentolan and have used it consistently in traumatic surgery and in infections for the past one and one-half years. The opinion of Ritter, Bruennings and others that the type of ointment is immaterial and that the principal thing is merely the application of an emollient immobilizing dressing does not agree with the findings. There is something unusual about the action of cod liver oil. Regarding the action of the vitamins, opinions are divided. The vitamin content of the unsaturated fatty acids and the tendency to peroxidation of cod liver oil seems important as observed by Henschen.

Clinical investigation shows that the production of granulations after the application of cod liver oil is very striking. Large amounts of tissue substance are replaced from the bottom of the wound to the skin level with the formation of better scars. In one case the rapid beneficial action of unguentolan on cell growth was observed in the healing of a chronic ulcer of the leg with sarcomatous changes. There are two layers of action: an acute layer which is a fine gray membrane containing fibrin where the cells are acted upon directly and a passive layer of apparently unchanged salve which acts in a purely mechanical way to condense and collect the secretions. There is a promotion of the wound secretion with an increase of from 25 to 50 per cent. The flow of the secretion begins within an hour and is most marked at the borders of the wound. The secretion pressure is increased attains its highest point after two hours and then drops and remains at a lower level for from six to eight days. The secretion contains less pus. The condition of the surrounding skin is not that of maceration but more like that of the washed hand in a moist chamber. When maceration or skin suppuration occurs it will heal promptly with dry

sterile dressings in one or two days. Every wound dressed with unguentolan exhibits an uninterrupted tendency to heal even if application of the ointment is interrupted. In fact the latter procedure is recommended by the authors. Abscesses and necrotic areas are disintegrated with remarkable rapidity. The authors have frequently punctured the abscesses and introduced the unguentolan which procedures are shortly followed by the spontaneous evacuation of the abscess without incision. Regarding the action of cod liver oil on bacteria, Loehr and Drygalski believe it has a bactericidal action but Goertz could not find evidence of it. The authors believe in a purely mechanical enveloping of the bacteria by the oil. Their bacteriological investigations of wound secretions do not show a decrease in the cultural growth of the bacteria. Cod liver oil appears to be antitoxic in its action, however which is shown by the fact that the fever often decreased ten points when the abscess cavities were prepared and filled with unguentolan. The local rise in temperature of the affected part remains elevated much longer than with moist dressings. The leucocytosis drops about 25 per cent but this drop occurs also with wet packs and is interpreted as a partial inhibition of inflammatory reaction.

Experimental investigations by Jenach revealed evidence of acceleration of healing in animal experiments. Cholesterol most assuredly has some influence but it is not the specific factor as Lauber assumes. There was observed also a definitely beneficial simultaneous influence upon distant wounds not dressed with unguentolan probably a vitamin effect. Cod liver oil does not have lytic properties in test tube experiments but an increase in the necrolysis at the place of contact of the oil and the pus was found a result also found clinically. Cod liver oil of itself cannot keep fresh wounds sterile. The bacterial growth progresses at its usual level even when no inflammatory reaction takes place. However cod liver oil has a definitely antitoxic action upon the suppurative process as shown by the fact that in experiments upon white mice the mortality decreased thirty per cent.

(FRANZ) J. DANIEL WILLEMS, M.D.

ANESTHESIA

Amiot L. G.: Anesthesia with Cyclopropane (L'Anesthésie par le cyclopropane). *Anes. et Anal.* 1937 3 195.

Cyclopropane is a hydrocarbon gas in which the carbon chain is arranged in a circle. The formula is



It is most commonly prepared from 1

to 3 dibromopropane or dichloropropane by reduction with a positive metal, such as zinc. The dichloropropane can be obtained from propane which occurs in natural gas. In France it costs about twenty times as much as nitrous oxide. It is heavier than air, moderately explosive especially when

mixed with oxygen or nitrous oxide. The general physiological and toxicological properties have been determined principally by American workers. The odor is not unpleasant, and does not cause a feeling of suffocation. Its principal advantage over other gases for inhalation anesthesia is that only from 18 to 22 per cent is required for anesthesia as contrasted with 50 per cent for propylene, and from 85 to 95 per cent with ethylene and nitrous oxide. This allows the anesthetized patient to have plenty of oxygen. It has quite a wide margin of safety. Its action on the kidneys, liver, and lungs is almost nil, but in strong concentrations it tends to produce cardiac arrhythmia, extra systoles, and a fall in the blood pressure. These effects can be partly eliminated by the pre-anesthetic administration of atropine.

On account of its cost it should be used with a closed system with soda lime to absorb the carbon dioxide. Very little gas is used with such apparatus, although oxygen must be added as needed. Suitable valves, indicators, or bags must be contained in the system so that the anesthetist knows how much gas is being used.

Waters, who has had the most experience with cyclopropane, recommends the following method of administration. Oxygen is first introduced into the mixing bag at from 8 to 10 liters per minute for from one-half to two or three minutes. The cyclopropane is then discontinued, and oxygen is continued at from 250 to 400 c. cm. per minute.

The author prefers to measure the gas used by volume rather than with a flow meter. He puts 3 liters of oxygen and 1 liter of cyclopropane into the gas bag. Anesthesia is started with this mixture. He determines by the reaction of the patient whether this is a correct proportion, and then prepares a stronger or weaker concentration, whichever is indicated in the mixing bag. When the correct proportion is obtained, very little additional gas is needed and only oxygen is administered.

The pupillary reflex is not an index of the depth of anesthesia with cyclopropane. Disappearance of the rolling motion of the eyeballs and of the corneal reflex indicates that the stage of anesthesia has been reached. Following that, the depth, rate, and rhythm of the breathing are the most important things to watch. Too deep anesthesia is characterized by a fall in the rate and diminution in the amplitude. Cardiac irregularities ordinarily occur only subsequent to these changes.

In clinical use cyclopropane causes no increase in salivation or the bronchial secretion, it gives adequate muscular relaxation in safe anesthetic doses; it is pleasant and easy to take and causes rapid loss of consciousness without a feeling of suffocation. It seems to increase capillary oozing, and may cause cardiac irregularity and a fall in the blood pressure. In large groups of collected cases reported by Schmidt and Waters, the number of fatalities was approximately the same as with ether. It is recommended by the author for diabetic patients, patients

with pulmonary disease, and patients with liver deficiency; and for operations on the lung, cesarean section, and war surgery. M. M. ZENNINGER, M.D.

Lundy, J. S : *Convulsions Associated with General Anesthesia. Surgery*, 1937, 1: 666

"The problem of convulsions or spasms associated with general anesthesia is one that is presenting itself with increasing frequency. Attention was not called to it until 1927, and since then most of the reports concerning it have come from England, although a few have been made in this country. It would seem that the condition has been recognized by but few. It seems important that the subject should be presented again, as was done in 1933 by Sears, in the hope that a solution may be arrived at. The problem of convulsions and spasms associated with general anesthesia has been studied to some extent from an experimental point of view."

Table 1, wherein are tabulated all of the pertinent facts reported in each case, shows a mortality of 18.9 per cent in the 144 cases reported. These cases were gathered from the literature, by correspondence, and through observation. These cases all fall into the category known as convulsions associated with general anesthesia; they were reported originally as "ether convulsions." In the literature and in the author's experience, there are cases in which the patient was known to have, or was found later to have had, epilepsy. It may be that in some cases, as various authors have pointed out, the condition reported as "ether convulsions" was confused with epileptic seizures, heat stroke, or muscle spasms attributable to ethyl chloride. Usually, there should be little difficulty in recognizing the epileptic seizure, as the fit begins suddenly with a violent tetanic spasm and usually subsides with a series of isolated clonic spasms, especially if the severity of the fit does not prevent the further administration of the anesthetic. At times, the anesthetization may be begun again after the first fit is over, and the patient may be anesthetized before another one appears.

The characteristic severe convulsion associated with general anesthesia, to which the author calls attention, usually begins with twitchings in the face, it spreads to other parts of the body with increasing violence, and may continue for hours unless treated. Woolmer and Taylor, who reported four cases in 1936, said: "The patient is a child or young adult with pyrexia, usually due to some acute septic condition. The theater is overheated. Atropine has been given, and the dose may have been excessive. The patient is deeply anesthetized with ether, the pupils being dilated and inactive to light. The color is, as a rule, good, and oxygenated ether is sometimes being given. The eyelids start to twitch, then the face, and the convulsions become general. In the immediately fatal cases, after five to ten minutes of convulsions, the respiration ceases, the patient goes blue, and the heart stops; in other cases, the convulsions stop, but the patient dies

later from cardiac failure, alternatively, recovery may follow the cessation of the convulsions."

The type of muscular seizure that is progressive and that is not of short duration may or may not be dangerous. The etiology may not be known, but in any event it seems that the important factors are that (1) the convulsions probably can be controlled by the use of barbiturates given intravenously and (2) the most dangerous cases are those in which there is profound toxemia and therefore, in selecting the anesthetic for such cases it might be better to use spinal infiltration or block anesthesia, a barbiturate given intravenously or avertin to produce basal anesthesia than to use an inhalation anesthetic only. In some cases of severe convulsions the use of sodium amylal or pentothal sodium might be preferred to the use of evipal sodium or pentothal sodium because of the prolonged effect of the former but if either evipal sodium or pentothal sodium is used and is not fully effective, it may be followed by the administration of sodium amylal or pentobarbital sodium.

The table in the original article shows the value and character of the literature on the subject of convulsions associated with general anesthesia. Unfortunately too few details are presented in the reports of cases therefore considerable confusion must exist in the mind of anyone who attempts to arrive at a decision in regard to the causes of the convulsions. When an overdose of a local anesthetic enters the blood stream it may act systemically as a convulsant. When it is believed that a convulsion associated with local anesthesia is identical with the convulsion associated with general anesthesia it only adds to the confusion that already exists. The author believes that convulsions which are associated with local anesthesia should not as yet be considered to be the same as those associated with general anesthesia although we may come to consider them so. Some authors believe that the heat of summer was a causative factor but it has been noted that such convulsions have occurred in the spring fall and winter as well as in the summer and that many authors do not give the time of year in which this untoward reaction developed.

The thirty three various causes or significant factors involved in the production of convulsions associated with general anesthesia which have been mentioned in the literature are: toxemia and epti-

cemia an excessive amount of carbon dioxide in the system impurities in the ether impurities in the oxygen, trauma deep anesthesia hypoglycemia the method of anesthetization instability of the nervous system, an overdose of atropine cerebral anemia alkalosis overbreathing an idiosyncrasy, a cerebral accident disturbance of the calcium metabolism, ketosis, heat, youth the use of oxygen anoxemia a latent tendency to fits changes in the blood overoxygenation sex susceptibility increased vascularity of the brain cortex concentrated ether deficiency of carbon dioxide lightness of the anesthesia hyperventilation anaphylactic edema the hydration of protein particles in the plasma and convulsant poisons. Fits caused by nitrous oxide and curare are respiratory fits. There are authors who just as definitely state that the convulsions are not caused by an excess of oxygen deep anesthesia excessive dose of atropine idiosyncrasy the use of oxygen or an excessive amount of carbon dioxide. Rosenow and Tovell (Am J Surg 1936 33 474) suggested that the condition is attributable to a neurotoxin or poison produced by streptococci in amounts insufficient to cause spasms in the absence of anesthesia, but which in the course of general anesthesia suffice to incite the muscular spasms characteristic of this condition.

As the patients were children in at least 53 per cent of the cases in which the age was given it would seem that this might be explained on the basis that children go into convulsions much more easily than adults if so the essential cause is not youth. The author was impressed with the work of Rosenow and Tovell and believe that they have offered the most convincing explanation of the cause of convulsions in the cases which have been studied at the clinic. Most of the other explanations in the literature have been personal opinions.

The author wishes to call this condition to the attention of those who directly or indirectly have to do with the administration of anesthetic agents to suggest a more careful choice of preliminary medication and anesthetic agents and to suggest the administration of a soluble barbiturate intravenously for symptomatic treatment and for the control of the convulsions so that this or additional treatment may be instituted in order to reduce the fatalities which are occurring much more commonly than has been realized.

PHYSICOCHEMICAL METHODS IN SURGERY

ROENTGENOLOGY

Morton, J. J., and Fray, W. W.: Radiographic Appearances about the Shoulder Joint, with Especial Reference to Cyst-Like Shadows: Clinical Cases. *Radiology*, 1937, 28 668

Physicians who have consulted the authors about the roentgenograms of the bones about the shoulder joint, and especially those of the upper end of the humerus, have often been confident that they were dealing with cystic changes in the humerus, clavicle, or scapula, with giant-cell tumors at the upper end of, or in the tuberosities of, the humerus.

Careful study of the films before and after a negative exploration in one case led the authors to believe that perhaps the position of the bones was not that which they had been accustomed to interpret. Repeated observations in dislocations of the humerus with consequent abnormalities in the position of the bones have served to substantiate this view.

The authors report seven cases in which trauma, infection, and disuse caused symptoms referred to the shoulder joint. They concluded from these studies that the physician must be guarded in his interpretation of peculiar-appearing areas in the bones about such joints. The roentgenological characteristics of bone cyst or giant-cell tumor must be remembered. The bone cyst is likely to be in the diaphysis below the epiphyseal line. A clean-cut area of thinning is visible in every position of the bone. Giant-cell tumor in the humerus is the so-called chondromatous giant-cell tumor described by Codman. It does not destroy the bone to the articular cartilage, but is restricted to the region of the greater tuberosity. The tumor does not extend into the head of the humerus much beyond the epiphyseal line.

HAROLD C OCHSNER, M.D.

Peirce, C. B., and Dirkse, P. R.: Pulmonary Pneumatocele (Localized Alveolar or Lobular Ectasia): Certain Considerations in Cystic Disease of the Lung. *Radiology*, 1937, 28 651

The authors quote the statement of Weller in regard to "congenital cystic lung." Weller recalled no instance in which changes were found in the lungs of newborn infants, or very young children, which led to the diagnosis of congenital cystic disease of the lung. Judging by analogy, it would be expected that a condition properly so designated would be encountered occasionally in young individuals.

The authors believe that cystic pulmonary disease should be classified roentgenologically under the following four main types.

1. True congenital pulmonary cyst or cysts
2. a. Chronic interstitial pneumonitis with emphysema.
- b. Chronic bullous emphysema

3. Cystic bronchiectasis

4. Pulmonary pneumatocele (localized alveolar or lobular ectasia).

The authors have had personal experience with only one patient in which the evidence of a congenital cyst was believed unquestionable. With the exception of two reports in the literature, they have found no report of co-existent air-filled cystic spaces and closed fluid-containing cysts.

The interstitial inflammatory changes associated with bronchopneumonia, or the progressive fibrosis in certain unresolved lobar pneumonias may induce sufficient contracture to cause an alveolar emphysema to become cystic in proportions.

The development of a chronic bullous emphysema in patients with asthma due to expiratory obstruction from bronchospasm may present a roentgenographic pattern of multiple air-cysts.

In the opinion of the authors, most of the cases reported since Koontz's article appeared in 1925 seem to resemble the third and fourth type of classification.

Lobular or bronchopneumonia in infancy and childhood may produce necrosis of the bronchial or bronchiolar wall, and rupture of these walls may allow air to pass along the septa during cough with the formation of subpleural blebs.

There may, therefore, be produced (a) sacular to cystic bronchiectasis, (b) focal acute lobular vesicular emphysema, or (c) peripheral bullous emphysema.

Two cases which are reported demonstrate the development of a cystic bronchiectasis following acute respiratory infections. The authors' concept of the origin of pulmonary pneumatocele is that it is the result of acute lobular emphysema associated with lobular pneumonia. They believe a persistent check-valve obstruction of the bronchial lumen is due to either non-resolution of the initial inflammation of the bronchus or a subsequent distortion by the dilated air spaces.

The intrapulmonary character is demonstrable by the bronchogram or diagnostic pneumothorax. Four cases are presented which are examples of this type. The authors conclude that the term "congenital" is improper in a roentgenogram diagnosis of cystic pulmonary disease without film evidence of such a lesion at birth. They doubt the congenital origin of cystic pulmonary disease in the majority of cases.

The article is profusely and well illustrated.

HAROLD C OCHSNER, M.D.

Heyerdahl, S. A.: On the Coutard Treatment of Malignant Tumors. *Acta radiol.*, 1937, 18 399

A brief general review of Coutard therapy serves as an introduction to the author's observations and results with this method of treating malignant

tumors Heyerdahl usually uses a 4 ma current 60 cm focal skin distance, 2 mm cu and 3 mm al filter and 175 kv. An average daily dose of 200 r with an intensity of from 3 to 4 r per minute is given, usually in 2 sances the fields are extended according to the site and extent of the disease and the total dose averages about 7000 r. Efforts were made to reach a total dose which produced an epidermic reaction with an epithelitis in the mucous membranes and, subsequently epidermitis accompanied by scaling of the skin.

Among the complications observed and inconveniences caused by them are mentioned 'early edema' which is usually subcutaneous but may appear in the deeper lying tissues. When the treatment involves the region of the larynx it may induce attacks of dyspnea which necessitate tracheotomy. An intense and early rubefaction accompanied by enanthemas in the mucous membranes was frequently noted. Nausea and vomiting were rarely very marked but occasionally required one or two day suspension of the treatment. Advanced cases with lymphatic metastases and a poor state of general health at times reacted so unfavorably that irradiation had to be discontinued. In some irradiation had to be discontinued because pains which were present were augmented rather than soothed by the treatment.

This article is based on cases treated during 1932 and 1933 with a period of subsequent observation of from two and one quarter to four years. It included twenty five cases of carcinoma of the larynx tonsils maxilla hypopharynx epipharynx palati molis and tongue and nine cases of bone tumors, five of which were metastatic in origin and four primary. Of the former group six remained symptom free during the period of observation and three of the nine cases involving the bones did likewise. All of these cases are tabulated and the results obtained in cases with various lesions are described in detail.

In conclusion it is stated that an insufficient period of observation prevents the summing up of the advantages of the Coutard treatment in the cases studied. The limited number and unfavorable types of cases referred for treatment also made the drawing of conclusions difficult. However the author believes that the method is very promising. It is comparatively mild and permits of protracted observation and regulation to meet individual requirements.

ADOLF HARTUNG M D

RADIUM

Pack G T and Taber L R. The Use of Radium Element Seeds in the Treatment of Cancer
Am J Roentgenol 1937 37 516

To provide radium institutions with a very flexible arrangement some time ago the authors introduced

into the United States the plan of uniform platinum filtered radium cells measuring 11.5 mm in length 1.0 mm in external diameter and 0.2 mm in wall thickness. The radium content is either 1.33 mgm delivering 10 microcuries destroyed hourly or 3.33 mgm, delivering 25 microcuries destroyed hourly. These platinum cells may be used in wax mouldages, plaques or trays for superficial irradiation in special applicators or bombs for uterine irradiation in platinum capsules for esophageal or intracavitary irradiation and finally in needles for interstitial irradiation.

Many times in using radium needles it is a distinct advantage to have radium foci of the smallest dimensions possible. The following table shows the comparative measurements of the various needles which are used most commonly.

	Total length mm	Internal length mm	External diameter mm	Filter mm PL
Cold sheath needle (containing radium cell)	24.5	12.0	1.9	0.5
Treves sheath needle (containing radium cell)	17.0	12.0	1.8	0.5
Cade radium needle	10.0		1.65	0.5
Martin radium needle	11.0		1.6	0.5
Radium element seed	7.5	3.27	1.2	0.3

The radium element seed the last in the table was suggested by the authors only recently as a substitute to gold radon seeds. It really is a tiny tube with an eyelet of smooth bore at one extremity through which the thread for removal is inserted. The wall filtration is the same as for the ordinary gold or platinum radon seeds and therefore the same dosage table may be used except for the fact that the intensity does not diminish exponentially as in the case with the decaying radon seed. The content of each radium element seed is 1.33 mgm, which is sufficient to deliver a dose of 10 microcuries destroyed hourly or 1000 microcuries destroyed (1 millicurie destroyed) in 100 hours. This is about the average dose for each seed. By withdrawing and reinserting the same radium element seeds in various parts of the tumor in a well distributed manner it is possible to prolong the interstitial irradiation over a period as long as three weeks as practiced in the Coutard method. The radium element seeds are inserted interstitially with the aid of a trocar of special design which is described in the original article. The authors never used these radium element seeds except in superficial and accessible neoplasms because of the danger that they may be lost in the tumor. These seeds appear to have a certain advantage in carcinoma of the lip oral commissure cheek, eyelid paranasal antrum auditory canal sinus parotid gland skin metastatic carcinoma in lymph nodes and in some benign tumors e.g. hemangioma.

T. LEUCUTIA M D

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Stoerring, F. K.: Operation and Diabetes (Operation und Diabetes) *Med Klin*, 1936, 2, 1589

Good results from operation on diabetic patients are possible only with the closest cooperation between the surgeon and the internist. In 1929 a report was issued on 110 cases of diabetic patients subjected to operation, who were protected from coma and from poor wound healing by large doses of insulin, or hyperinsulinization, according to Umber's principle. Joslin has reported successful results in 789 diabetic patients operated on between 1931 and 1935. Prophylaxis against infection is very important. The best results are obtained in diabetics with surgical diseases who do not need to be operated upon immediately. Even in these instances treatment with large doses of insulin is in place. Stoerring not only gives an additional 6 to 10 gm of carbohydrate with the minimum quantity of insulin, but after aglycosuria has been produced he increases the individual insulin doses by from 4 to 8 units to obtain a decrease of the blood sugar to normal. It is necessary to distribute the daily requirement of insulin over from 4 to 6 injections and to watch the urinary and blood sugar values. If insulin edema appears, the patient must be put on a diet poor in salt and limited as to fluid for the purpose of dehydration. When these measures are taken gangrene of the toes not infrequently heals or, at any rate, ceases to progress. Moist treatment must be avoided. On the other hand, it is often difficult to bring patients into a state fit for operation, for example, a patient suffering from both pyloric stenosis and severe diabetes. The situation is particularly difficult in cases of an acute emergency character. In such cases from 20 to a maximum of 40 units of insulin are administered intramuscularly shortly before operation and about 15 minutes thereafter from 80 to 100 c cm of 25 per cent dextrose infusion are given intravenously. Mention is made of the fact that not infrequently comatose patients present pronounced signs of pseudoperitonitis in consequence of toxic irritation of the celiac plexus. The abdomen will be board-like and tender, and the pulse will be small, and very rapid. In any case, the coma must be combated first and then the condition treated expectantly for a while unless the anamnesis provides clarification.

For extensive operations, particularly on the abdomen, the author recommends

1 Three supplementary feedings of carbohydrate in fluid form, preferably as dextropur in fruit juices, with or without cebion, are given three to four hours before operation. About 24 to 28 units of insulin are injected intramuscularly a quarter of an hour previously to take care of these feedings.

2 About one half hour before the beginning of narcosis from 60 to 20 units of insulin are given intramuscularly, and 15 minutes later from 80 to 100 c cm of a 25 per cent solution of dextrose are injected intravenously.

3 In case of a prolonged operation, an intravenous infusion of from 80 to 100 c cm of a 25 per cent solution of dextrose together with 12 units of insulin is given.

4 Not later than from three to four hours after the operation 24 units of insulin are administered intramuscularly, and fifteen minutes later from 80 to 100 c cm of a 25 per cent solution of dextrose are given intravenously.

5 In the evening, a drip clysis of 1,000 c cm of a 4 to 10 per cent solution of dextrose is administered. At the start of the drip clysis from 8 to 12 units of insulin are injected intramuscularly and the same dose is repeated one half hour later during the clysis.

It is a grave error to omit the insulin on the day of operation because narcosis is always harmful. Inhalation narcosis and, above all, chloroform is very dangerous. For brief anesthetics, eunarcon has proved particularly valuable because it does not cause nausea and vomiting. For amputations spinal anesthesia is recommended. In the after-treatment continuous hyperinsulinization is advised as, without it, the wound heals poorly.

(FRANZ) FLORENCE A CARPENTER

De Takáts, G.: Reflex Dystrophy of the Extremities *Arch Surg*, 1937, 34, 939

The author believes that after a mild trauma, usually a blunt injury affecting a wide surface, or a low-grade infection of traumatic or non-traumatic origin, partial injury to a nerve, frost bite, or a burn, there occurs occasionally a peculiar vasomotor and trophic disturbance which has been designated by a variety of names, depending on the outstanding symptom. The vasomotor disturbance may later be overshadowed by trophic changes. A hard, non-pitting edema is only one symptom and is sometimes hardly noticeable. The osteoporosis is often found, but it should be distinguished from atrophy due to inactivity by its sudden appearance after trauma, by its spotty distribution, and by the accompanying pain and vasomotor disturbance.

Reflex dystrophy is often mistaken for the atrophy of disuse, for artificial edema, for anxiety neurosis, or for malingering. He believes that the important feature of this peculiar disturbance of tissue metabolism is an exaggeration of a nutritional reflex set up by the initial injury or infection which does not subside when the effects of trauma or infection have been overcome, but becomes a fixed, self-perpetuating mechanism in which the catabolic activities are predominating.

The author describes five cases of reflex dystrophy of the extremities. One followed a mild injury to the soft tissues, one a pelvic lymphangitis, one an axillary thrombosis, one a nodular phlebitis of the veins and one a low grade infection of the soft tissues.

The excision of the irritable focus was possible in three of his cases. Heat immobilization and diathermy have been successful in many of the cases of milder involvement. The patients for whom he had advised sympathectomy had already been found resistant to conservative therapy before the afferent or efferent arc of the reflex was interrupted.

ERIC C. ROBERTS, M.D.

Frimann Dahl, J. and Waaler, G. Roentgenological and Pathological Anatomical Studies on the Tuberculous Primary Complex (Roentgenologische und pathologische anatomische Studien ueber den tuberkuloesen Primaerkomplex). *Acta radiol.* 1936 Supp. 33.

It has been definitely shown that there is a difference between the course of the first tuberculous infection and that of additional infections in regard to the time of the appearance of lymph gland affections, the anatomical picture, and the appearance of lymph node affections. In additional affections the lymph nodes are not infected. The organism reacts differently in the first attack of the tubercle bacilli than later. This difference is expressed in the simultaneous attack upon the regional lymph nodes, the lungs at the hilus upward along the trachea or downward along the esophagus, the attack upon a single lymph node, and often upon a chain of several nodes. Usually the process is more extensive in the lymph nodes than in the organ itself. This definite double involvement, the formation of foci in the organ and lymph nodes, is called the primary complex. Aside from this associated involvement of the lymph nodes, the histological picture characterizes the primary affection so that it may be distinguished from later tuberculous affections.

Norwegian von Pirquet tests have shown that a large part of the population arrive at adolescence without tuberculous infection, only about half have given a positive von Pirquet reaction at the age of twenty years. Inasmuch as the positive von Pirquet reactions constantly increase with the advance in years until they become almost universal, it must be assumed that a great number of primary infections occur at advanced age, and at one time it was thought that in such cases the tuberculous disease develops relatively shortly after the infection and produces the high morbidity and mortality shown by the statistics. A pathologic-anatomical and roentgenological investigation of autopsy material with special consideration of the tuberculous primary complex is of interest.

Among 50 unselected autopsies of patients of all ages, 142 cases, or 72 per cent, showed the picture of a primary complex, and it was found especially in 47 per cent of the patients in the third decade when the cause of death was not tuberculosis. The au-

thors are convinced that the primary complex always produces a characteristic picture and that this picture is not produced by additional infections. Their figures for the frequency of the occurrence of the primary complex at the various age periods coincide with those of the von Pirquet test especially in the agricultural population.

In the cases in which tuberculosis was the cause of death, the authors often found that the primary complex appeared to be fresh, so that the anatomical picture supported by the history suggested an outbreak of the disease shortly after the infection, even in adults. Therefore primary infection with pulmonary tuberculosis or general tuberculosis appearing soon thereafter must occur quite often in adults in Norway. There frequently are cases of tuberculosis in which the primary affection is of longer duration. In these cases it is possible that the infection had occurred in childhood, but this cannot be proved. From some of the histories it is evident that these patients were also infected at adult age.

The cases with positive von Pirquet reactions in which no primary complex was demonstrable may be partly explained by the fact that because of the small size of the lesion or its localization it was overlooked. Also the lesions may have been overshadowed by an extensive tuberculous process. Cases in which a primary complex was found, but which gave a negative von Pirquet reaction on clinical examination may be explained by a too short stay at the hospital, 'anergic phase' or by diseases, heart disease or tetanus, which cause the von Pirquet reaction to disappear.

In most of the cases the macroscopic and microscopic pictures point definitely to the diagnosis. The primary focus may be seen readily, but there are also other features which are difficult to interpret especially histological features which look like a primary focus, but must be considered as secondary foci as the corresponding lymph node focus is absent.

In the lungs the primary foci are uniformly distributed over the entire lung, especially in relation to the respiratory volume of the individual part. Not rarely calcified foci occur, which give rise to differential diagnostic difficulties because they produce shadows in the roentgenogram which are just as dense as the primary foci. Chief among these are calcified thrombotic arterial contents or emboli which were found in 6 cases. There is also compact bony tissue filling the alveoli in the form of small nodular corals, often called osteomata, which was found in 8 cases. It was assumed that this developed on the basis of an unresorbed exudate. Anthracotic and silicotic nodules were also found. They often contained small necroses and were then produced at least partially by tuberculosis, just like calcifications and ossifications in cartilaginous pleural indurations. There were also calcified foreign bodies in 3 cases.

A comparison of the roentgenograms taken during life and after death shows that small calcified foci both at the hilus and in the lungs are often not visible in the usual clinical roentgenograms and

therefore, often fail to establish the diagnosis of a primary complex. On the other hand, there are a number of calcified processes that give rise to erroneous interpretations, as they are considered to be primary foci during life. LOUIS NEUWELT, M D

Patey, D H.: Experimental Observations on the Spread of Carcinoma by the Blood Stream, with Special Reference to the Difference Between the Portal and Systemic Routes. *Brit J. Surg*, 1937, 24 780

The present work was undertaken with the object of comparing experimentally the spread of malignant disease by the portal and systemic routes of the blood stream. It is well known from clinical experience that the incidence and distribution of blood-borne metastasis differ greatly in carcinoma in different locations: for example, they are very different in carcinoma of the large intestine from those in carcinoma of the breast. It is impossible to say from clinical evidence alone to what extent these differences depend on the different characters of the tumors, and to what extent on the different anatomical relations in the two locations. Experimentally, this difficulty can be overcome by using the same tumor in both locations. Foulds has published interesting observations on the spread of a carcinomatous tumor of the rabbit following the introduction of tumor cells directly into a systemic vein. In particular, Foulds's work seems to point to a possible resistant action on the part of the reticulo-endothelial system to blood-borne metastasis. The tumor used in the present experiments was the same as that used by Foulds, a carcinomatous tumor discovered by Brown and Pearce growing on the scrotum of the rabbit and successfully transmitted by them to other rabbits by inoculation into various sites. For the systemic injection the ear vein was used, for the portal injection the animal was anesthetized with ether, the abdomen opened, and the injection made into the main axial mesenteric vein of the small intestine. Surviving animals were killed usually about from three to five weeks after the in-

jection, and a general examination for deposits was made of the tissues and organs, excluding the brain, spinal cord, and the interior of the bones.

The experiments show that under controlled conditions tumor cells reaching the blood-stream by the portal vein give rise to metastatic deposits in markedly fewer cases than tumor cells entering through a systemic vein. This corresponds to the findings in human malignant disease, in which blood-borne metastases are much more frequent in tumors of the systemic territory, such as carcinoma of the breast and nevocarcinoma, than in tumors of the portal territory, such as carcinoma of the large intestine. The results of experiments suggest that one of the factors responsible for the diminished incidence of blood-borne metastases in man, in tumors of the portal territory, as compared with tumors of the systemic venous territory, is the barrier of the liver. Tumor emboli entering the portal vein have to pass through the capillary network of both the liver and the lungs before they reach the organs of the systemic circulation, whereas emboli entering a systemic vein have to pass only the capillary network of the lungs. The portal-borne emboli are thus doubly filtered, and for this reason alone metastatic deposits would be less. It is possible that some of the deposits in the liver following systemic injection represent secondary emboli from deposits in other organs such as the kidneys. It is also possible, particularly in view of Foulds's work on the part played by the reticulo-endothelial system in the resistance to blood-borne metastasis, that the cells of this system in the liver play some part in the lower incidence of liver deposits following portal injection, and also in the lower total incidence of deposits.

The experiments also confirm the marked selective affinity of certain tumors for certain organs. In spite of the double barrier of the capillary network of the liver and the lungs, the kidney was the organ which most frequently showed deposits after portal injection, as well as after systemic injection. Anatomical vascular factors seem to play a subsidiary part in this selective affinity.

JOSEPH K. NARAT, M D.

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INTERNATIONAL ABSTRACT OF SURGERY

NOVEMBER, 1937

ABSTRACTS OF CURRENT LITERATURE SURGERY OF THE HEAD AND NECK

HEAD

Sorrel, Sorrel-Déjerine, and Gigon: One Hundred and Nine Cases of Fracture of the Skull in Children (À propos de 109 cas de fractures du crâne chez les enfants) *Presse méd.*, Par., 1937, 45 761

Over a period of four years the authors studied 109 cases of skull fracture in children whose ages ranged from three months to fifteen years. In this connection they noticed that skull fractures in children take a relatively benign course even if the symptoms at the onset are very severe. They heal very rapidly and, as a rule, do not cause permanent complications.

In 87 cases the authors were able to ascertain the exact site of the injury: there were 50 isolated fractures of the cranial vault, 22 cases of fracture of the base of the skull, and 15 cases involving both the vault and the base of the skull. The extent of the injury did not seem to be proportional to the severity of the clinical signs. The authors observed also several types of relatively rare fractures of the skull among this series of children.

Meningo-encephalic complications were relatively frequent. The authors observed 4 extradural hematomas. In another 4 cases there was a tear of the dura mater.

The incidence of subdural hematoma, including in this group all cases with diffuse hemorrhage, was limited to 9 cases. Not a single case of cerebral edema was observed in the entire series, and also no case of ventricular blockage was reported.

Concerning the indications for surgical intervention, the authors depend mainly upon the modifications of the pulse. They observed that soon after the accident the pulse is accelerated, the average rate being between 140 and 180 beats per minute. With a favorable course of events the pulse rate soon decreases spontaneously and becomes normal in from six to eight days. If the fast pulse persists, however, or if the pulse becomes weak and irregular, the case is potentially a surgical

one and should be watched very carefully. Pulse readings in such cases should be taken every hour. In certain cases the character of the pulse is the only criterion for surgical intervention.

The neurological signs observed in connection with skull fractures in children include convulsive seizures, paralysis of the extremities and of the cranial nerves accompanied by hemianopsia and aphasia. Another important sign is a muscular hypotonia which is manifested by a hyperextensibility of various portions of the extremities and a diminution of vivacity of retraction upon drastic stimulation. In their series, only 4 children showed mydriasis. Of the latter, 3 recovered without operation, and in the fourth child the mydriasis disappeared spontaneously in the course of a few days. In the other cases the mydriasis persisted and was found to be present even three years following the accident.

The authors performed spinal punctures and measured the pressure of the cerebrospinal fluid. The presence of blood in the fluid often confirms the diagnosis of skull fracture, but in the authors' series it was found to be of little value as a criterion for surgical interference.

The total mortality in the authors' series was 22 per cent. Death occurred invariably within the first forty-eight hours. Of the 85 surviving patients, 53 recovered spontaneously and 32 required surgical intervention.

The authors conclude that in children the prognosis of fracture of the skull is good. In surgical cases, the operation should be performed as soon after the accident as possible.

RICHARD E. SOMMA, M.D.

Axhausen, G.: The Operative Correction of Acquired Facial Asymmetry (Die Operative Korrektur der erworbenen Gesichtssymmetrie) *Deutsche Ztschr. f. Chir.*, 1937, 248: 533

The author reports his rich experiences in the field of acquired asymmetry of the face. This condition usually results from the severe forms of acute osteo-

myelitis of the lower jaw The shortening may be due to a loss of substance in the horizontal part of the lower jaw or may be due to a terminal or residual defect after the infection In both instances the chin is pulled toward the affected side and at the same time pulled backward On the well side the lower jaw is smoothed or flattened so that facial symmetry is lost The author differentiates several types of asymmetry

1 Those cases in which there is almost complete occlusion of the teeth In this group the author refrains from operative lengthening of the shortened lower jaw since this procedure would necessarily interfere with the existing good occlusion and efficient mastication

2 The second group includes those cases in whom occlusion is defective or bad In these an operative elongation of the abbreviated lower jaw must be attempted The extent of the procedure depends on whether the asymmetry has resulted only recently or whether it is of long standing Since the author makes the state of occlusion the guiding principle in his classification of acquired facial asymmetry he determines the choice of operative procedure on the occlusal state of the dentition likewise Occlusion is the chief point of interest the cosmetic appearance is secondary The author has operated upon a number of patients with horrible deformities The correction with bone inlays and rubber appliances gave most excellent results The technical points are best followed in the original article as they are difficult to comprehend without illustrations A noteworthy procedure is the author's use of a tibial implant covered with periosteum which is implanted subcutaneously and is later placed into the defect in the lower jaw (VOGELER) JACOB E KLEIN M D

Dubecq V J Morphological Physiological and Clinical Researches on the Mandibular Meniscus Habitual Dislocation and Temporomaxillary Cracking of the Jaw (*Recherches morphologiques physiologiques et cliniques sur le ménisque mandibulaire luxation habituelle et craquements temporomaxillaires*) J de méd de Bordeaux 1937 314 125

Dubecq has given a concise review of the researches on the mandibular meniscus and from his study thinks that all names such as snapping jaw and cracking jaw should be discarded and the term painful cracking of the jaw substituted He states that the triad of symptoms of pain cracking and eventually blockage should justify recognition of the syndrome of the mandibular meniscus This triad of symptoms is not always present however as pain is frequently absent and there may be early blockage in cases due to trauma of orthodontic manipulation or tooth extraction

In Dubecq's description it is pointed out that the mandibular meniscus is an intra articular fibrocartilage that is movable and the main function of which is to deaden the blow of the condyle in the glenoid and against the auditory canal It may be affected

by disease or trauma and may be worn through when the teeth are lost In the dog the meniscus may be removed without producing symptoms and if traumatized *in situ* blockage of movement develops This blockage finally disappears because of complete absorption In Dubecq's patients pain was an almost constant finding followed by cracking and only occasionally by blockage Dubecq has divided the patients observed into three groups on the basis of treatment (1) those treated conservatively without operation (2) those given alcohol injections into the joint and dental appliances to correct occlusion or limit the opening (3 a) those operated on the glenoid or articular tubercle to block the opening with local bone grafts and (3 b) those operated on the capsule or the meniscus for resecting them and those in which a total removal of the meniscus was done This last procedure was the most favored and was done in eleven of thirty cases.

JAMES B BROWN M D

EAR

Ashley R E Postauricular Fistula *Ann Otol Rhinol & Laryngol* 193 46 477

The author discusses various methods of repairing postauricular fistulae and reports in detail his tongue flap operation He lists the advantages of this operation as follows

The fistula is permanently closed

The cosmetic results are excellent

Tissue contiguous to the fistula is used in its repair and therefore only one operation is required

The operation is simple and requires very little time

There is little danger of the wound breaking down because of the rich blood supply and the well known rapid healing of the scalp

The cavity is lined with periosteum the natural covering of bone

The flaps contain all the elements required for rapid healing and infection resistance i.e fat muscle a good blood supply and periosteum rich in antibodies

The operation is satisfactory for closing all types of postauricular fistulae including those complicated by extensive loss of tissue

JAMES C BRASWELL M D

Hadjopoulos L G and Bell J W Direct Versus Intermediate Pathways in Infections of the Mastoid *Arch Otolaryngol* 1937 25 601

In contrast to the general belief that the common source of infection of the mastoid is through the natural anatomical atria the eustachian tube tympanum antrum and mastoid cells the authors bring evidence to support the less accepted theory that the major and more important sources of infection of the mastoid are the blood and lymph channels of the adjacent mucosa

An attempt to demonstrate streptococci in mastoid tissues failed to show streptococci diffusely dis-

seminated in such tissues. On the contrary, the streptococci were found to be strictly localized in certain channels in the tissues, of which some were definitely venous, others lymphatic, and still others indefinite as to origin but definite in outline.

JAMES C. BRASWELL, M.D.

PHARYNX

Lahey, F. H., and Hoover, W. B.: Pharyngo-Eso-phageal Diverticulum. *New England J. Med.*, 1937, 216: 591.

The authors report fifty-three cases of diverticula of the esophagus, forty-three of which occurred in the male.

Nearly all of the patients complained of difficulty in swallowing, regurgitation, gurgling noises in the neck, choking, strangling, or coughing attacks, in the given order of frequency.

Diverticula are believed to be due to obstruction of the upper end of the esophagus, which interferes with the ready passage of food. This increased pressure produces a herniation of the pharyngeal mucosa

through the weak portion of the wall of the hypopharynx. There is considerable speculation as to the manner in which this obstruction takes place. Many believe there is an incoordination between the cricopharyngeal muscle and the constrictor muscles of the pharynx.

The diagnosis is relatively easy from the clinical history and is easily verified by means of the roentgen rays.

The operation is done in two stages from ten to twelve days apart, and the most important procedure is the complete freeing of the neck of the sac from all encircling muscle fibers.

The most common complication was temporary fistula from the pharynx to the skin incision. Post-operative dilatation was carried out in all cases in which it was possible, with a modified Plummer dilator which was passed over a previously swallowed string.

Two patients had a complete recurrence of the sac, and nineteen showed a little barium retention, but eleven of the latter were free from symptoms.

JOHN F. DELPH, M.D.

SURGERY OF THE NERVOUS SYSTEM

BRAIN AND ITS COVERINGS, CRANIAL NERVES

Cox L B Tumors of the Base of the Brain Their Relation to Pathological Sleep and Other Changes in the Conscious State *Med J Aus* *tralia* 1937, 5 742

There is almost a unanimity of opinion that consciousness is a cortical function. However experiments on animals and circumscribed lesions mostly small tumors in man have clearly indicated that the cerebral cortex is under control from two areas one in the anterior part of the third ventricle which increases consciousness the other in the posterior part the central gray matter of the aqueduct and the medulla which decreases consciousness. In man tumors of these regions have caused such phenomena as drowsiness hypersomnia trance like states periods of apathy, catatonic states alterations in disposition disorientation memory impairment, and mental excitement. In certain cases removal of the tumor resulted in recovery from the abnormal mental state. The author agrees with Pavlov and others in relating sleep to an inhibitory process. He explains conditions of decreased consciousness as disturbances of the sleep mechanism. Lesions in the anterior part of the third ventricle are associated with hyperactivity and exalted consciousness. It is recognized that the activity of the thalamus and hypothalamus is concerned in the conscious state. Lesions of the e nuclei cause *inter alia* emotional disturbances. The author believes that the region of the brain termed hypothalamus and basal ganglia may be of importance for the better understanding of the problem of usage conduct.

DAVID J IMPASTATO M D

Carrillo R Parasellar Tumors (Tumores paraselares) *Semana med* 1937 44 1243

The purpose of the present study is to supplement the data on the ventriculography of parasellar tumors by adding the results obtained with lipiodol. Carrillo reports six operated cases one pure parasellar two each with temporal and frontal extensions and one with an intrasellar extension. He gives detailed descriptions accompanied by sketches of the iodoventriculograms and compares the information given by them with that obtained with pneumography and simple radiography.

From the anatomical clinical and radiological standpoints the tumors of this region are classified as intrasellar or adenomas presellar or optic nerve gliomas retrosellar or adamantinomas or craniopharyngiomas clastosellar or giant tumors which totally destroy the sella intra extrasellar infundibular which are properly called tumors of the third ventricle and parasellar tumors. The author subdivides the last group according to the direction of

growth into tumors with frontal temporal or intrasellar extension and pure encapsulated parasellar growths which remain *in situ*. The pure form and those with temporal extension arise from the greater wings of the sphenoid the frontal and those invading the sella from the lesser wings. Tumors of the greater wings are characterized by exophthalmos the syndromes of Foster Kennedy and of the sphenoidal fissure and integrity of the visual fields. Those of the lesser wings produce bilateral optic atrophy and changes in the visual fields. The frontal and sensorimotor symptoms are due to compression of the anterior and middle cerebral arteries respectively.

The author's conclusion is that only ventriculography with iodized oil permits a definite diagnosis of affections of the chiasm and adjacent regions. Roentgenograms may prove the existence of a tumor if there is erosion of the roof or a triangular enlargement of the optic canal but they do not show the size and shape of the tumor or the direction of its growth. In every case of sellar and parasellar tumor roentgenograms of the optic foramen should be made. The ventriculograms of parasellar tumors with lipiodol are characterized primarily by a deformity or filling defect of the sphenoidal pole and secondarily by deviations or deformities of the third ventricle and frontal pole. Each type of parasellar tumor has its peculiar picture. The alteration of the sphenoidal pole is an early sign common to all types and extremely characteristic. Similar but slighter changes are found in tumors of the temporal lobe. In pneumograms the condition of the sphenoidal pole infundibulum and optic recess is not clear.

There are five well defined pictures with lipiodol at the level of the sella hypophyseal tumors parasellar tumors serous arachnitis fibro-adhesive arachnitis of the chiasmatic cistern and basal meningitis. Their differential diagnosis would be very problematic without the use of iodized oil.

The article is accompanied by references photographs perimetric charts ventriculograms and sketches of the tumors. M E MORSE M D

Chavany J A and Placa A Hemiplegia from Brain Tumors and Especially from Tumors of the Hemispheres (*L'hémiplegie dans les tumeurs cérébrales et spécialement dans les tumeurs des hémisphères*) *Revue méd* *Par* 1937 30 589

This study of hemiplegia is based upon forty five cases which were verified either at operation or necropsy. Two thirds of the tumors were benign, one third malignant.

Ordinarily the initial symptoms of brain tumor result from intracranial hypertension and the diagnostic problem is one of localization. When hemiplegia is the first symptom the problem is reversed and becomes a matter of etiology.

Rapidly developing flaccid paralysis is indicative of a destructive lesion of the pyramidal tract. Slowly developing paralysis with evidence of stimulation, such as contractures, is caused indirectly by pressure on the pyramidal tract. In the former, signs of intracranial pressure are absent and the paralysis is the initial symptom. In the latter, other symptoms of intracranial disturbance will precede the paralysis, for example, jacksonian attacks and choked discs. Tumors located in the anterior part of either the temporal or parietal lobe and less commonly in the temporo-occipital region exert pressure and cause paralysis by the so-called "temporal cone of compression." This was shown by Vincent in 1930 and 1936. The internal portion of the temporal lobe exerts pressure on the mesencephalon. Occasionally the hemiplegia is homolateral because of compression of the hemisphere on the side opposite the tumor.

The prognosis of hemiplegia due to tumor varies widely and depends upon the structure of the neoplasm. All the meningeal tumors and the well differentiated gliomas have a favorable outlook. Cellular astrocytomas and glioblastomas, on the contrary, give a hopeless prognosis.

Clinically the hemiplegia seldom fails to be preceded by prodromal symptoms, of which hypotonia of an extremity is of major importance. The paralysis succeeds the hypotonia and spreads more or less rapidly to become hemiplegic. Jacksonian attacks are not infrequent, but they have localizing value only if the distribution of the crises is constant.

There is no means of knowing whether a tumor is intracerebral or extracerebral, but the course of the symptoms reveals quite accurately the benign or malignant character of the growth. When the pre-paralytic phase is prolonged, marked by jacksonian attacks or by limited paresis with contracture, some such benign tumor as a meningioma may be suspected. In this type of case the signs of intracranial hypertension are absent.

With malignant tumors, hypotonia, paresis, and paralysis develop in rapid succession and jacksonian attacks occur rarely. Tumors of the left temporal lobe may cause speech defects somewhat prior to the paralysis. The latter may become complete within as short a period as two or three weeks. It is always flaccid. At the same time papilledema usually appears.

Between the two extremes just described there are intermediate forms due to the less malignant gliomas.

A hemiplegia that is the result of a "temporal cone of compression" occurs in patients already showing the general symptoms of brain tumor. The paralysis is most apt to appear suddenly after a lumbar puncture.

Finally, a few cases have been observed in which hemiplegia has suddenly occurred without other symptoms. Usually the tumor proved to be metastatic but occasionally it has been primary in the brain. The paralysis has been known to regress or remain stationary, adding to the difficulties of diagnosis.

The authors discuss in detail the special methods of neurological diagnosis and sound a warning

against lumbar puncture in patients suspected of having a brain tumor. ALBERT F. DE GROOT, M.D.

Saralegui, A. F.: Tumors of the Third Ventricle from the Viewpoint of Clinical Surgery (Consideraciones generales sobre los tumores del tercer ventrículo desde el punto de vista clínicoquirúrgico). *Arch. argent. de neurol.*, 1936, 15: 117.

Saralegui reviews, with references to reported cases, the anatomical classification, symptomatology, diagnosis, and treatment of tumors of the third ventricle. Although disturbances of the tubero-infundibular-hypophyseal system are very suggestive, they are variable and occur also in a considerable number of inflammatory and infectious conditions, in which, in fact, they are more constant than in tumors. The neurological symptoms also are inconstant, complex, common to other localizations, and often misleading. For a rapid and decisive diagnosis, there are two methods: perimetry and ventriculography with iodized oil.

The author reports a case of a large craniopharyngioma which invaded the third ventricle. The patient, a youth of twenty years, complained of a rapid loss of vision, which began suddenly two weeks before admission to the hospital. There was bilateral optic atrophy, and the mental reactions were slow. The diagnosis of tumor of the third ventricle occluding both foramina of Munro was made by means of encephalography with lipiodol. The intraventricular growth was destroyed with the electrocautery; the approach was made across the corpus callosum. The patient died in coma seventeen days after operation. At autopsy, it was found that the tumor had destroyed the hypophysis and invaded the chiasm and optic tracts.

A bibliography is included. M. E. MORSE, M.D.

Weinberg, M. H., Mellon, R. R., and Shinn, L. E.: Two Cases of Streptococcic Meningitis Treated Successfully with Sulfanilamide and Prontosil. *J. Am. M. Ass.*, 1937, 108: 1943.

The authors report two cases of streptococcic meningitis which were treated successfully with sulfanilamide and prontosil. The first case was that of a boy aged seventeen years who developed streptococcic meningitis associated with otitis media with mastoid involvement. He was given 5 ccm. of prontosil muscularly three times a day for three days, 5 ccm. twice a day for one day, and 5 ccm. once a day for two days. The sulfanilamide was given orally, 1 tablet six times a day for five days. The boy's temperature fell 3 degrees on the first day of treatment, and by the fourth day he showed marked improvement. A complete recovery followed, except for occasional diplopia and dizziness.

The second patient, a girl ten years of age, likewise had a streptococcic basal meningitis associated with otitis media. She received 5 ccm. of prontosil intramuscularly four times a day for two days. Sulfanilamide was given orally as follows: 5 grains every four hours for two days, 5 grains every two

hours for two days and 10 grains every two hours for two days. The sulfanilamide was then administered rectally 15 grains every six hours for two days and 10 grains every six hours for two days. Despite the original moribund condition of the girl general improvement was noted after forty eight hours. On the ninth day after treatment a slight yellowish tint of the skin was noted. A moderate secondary anemia was present. The patient recovered except for a partial paralysis of the left third nerve.

The authors believe that sulfanilamide and pron-tosil should be used promptly in cases of streptococcal meningitis.

ROBERT ZOLLINGER M D

PERIPHERAL NERVES

Platt H Woods Sir R S and Bentley F H
A Discussion on Injuries of the Peripheral Nerves *Proc Roy Soc Med Lond* 1933 30 863

Platt's presentation is based upon eighty nine cases of peripheral nerve lesions all occurring in Platt's private practice. Platt is concerned with the prognosis and treatment of (1) nerve injuries accompanying fractures and dislocations such as dislocations and fracture dislocations of the shoulder joint radial nerve lesions in fractures of the humerus nerve lesions in fractures and dislocations of the elbow and external popliteal lesions (2) nerve injuries due to penetrating wounds (3) traction lesions of the brachial plexus such as birth palsy and traction lesions in the adult. It has been his experience that the ultimate outlook is good in circumferential palsy as well as in lesions involving the infraclavicular plexus trunks when the head of the humerus is dislocated. Many primary lesions progress to almost complete cure without surgery but secondary lesions always require scar excision and open reduction. He advocates conservatism in the treatment of radial nerve injuries in the humerus fracture believing that if operation is withheld for a few months many cases will show spontaneous recovery. He reiterates the common warning either of these important nerves (the ulnar and median) may be completely divided through a tiny wound and that in all penetrating wounds in the lower half of the forearm a careful test of (a) median and ulnar nerve function and (b) flexor tendon function should be made. He is pessimistic about the results of brachial plexus surgery in cases of birth palsy and admits that attempted repair of traction lesions of the plexus in the adult is usually disappointing but that at least exploration does establish a definite diagnosis and may be a guide in a program of physical therapy.

Woods emphasizes the importance of proper examination of peripheral nerve lesions and accurate observations of skin and other sensibility voluntary muscular control and electrical responses of all relevant muscles by all the means that are clinically practicable. He offers too a summary of the physiology of nerve and muscle response to electrical stimulation.

Bentley deals with the necessity for accurate end to end apposition in nerve suture. He urges the necessity of fine silk suture material and on the basis of some experiments of nerve grafting in rats arrive at the conclusion that it is doubtful whether long homoeo-grafts such as nerve tissue taken from another individual or cadaver would be successful in man.

JONES MARTIN M D

SYMPATHETIC NERVES

Ljwaga P Experiments for a Surgical Cure of Diabetes Mellitus. I. Bilateral Resection of the Splanchnic Nerves (Esperimenti per una cura chirurgica del diabete mellito. II. La resezione bi-laterale degli splancnici) *Clin chir* 1932 13 353

The author summarizes the findings in his experiments as follows:

Ligature of a great part of the pancreas does not cure diabetes. Ligature of the salivary ducts including Stenson's duct, does not alter the diabetic course. Enervation of the suprarenal glands does not result in a clinical cure. Thyroidectomy causes a diminution of the blood sugar as well as myxedema. Administration of thyroid causes a return of the high blood sugar. Bilateral splanchnicectomy does not change the sugar metabolism appreciably in diabetic animals.

DAVID IMPERATO M D

Bräuer W Surgery of the Lumbosacral Sympathicus (Die Chirurgie des lumbosacralen Sympathicus) *Verhandl d 10 Kong internat Ges Chir* 1936 1 23

The author has in the past ten years performed a total of 247 operations on the lumbosacral sympathicus including periarterial sympathectomies. The widely held opinion that periarterial sympathectomy is particularly dangerous or at least entirely without effect is false. However it is indicated only in true Raynaud's disease in certain trophic ulcers in causalgias and in a few forms of reflex dystrophy of the extremities. In these conditions it is capable of producing very successful results. On the other hand in arteritis obliterans it is useless. The author has never found any complications following periarterial sympathectomy.

Operations on the sympathetic trunk and other parts of the lumbosacral sympathetic system in cases in which there has been thorough anatomical orientation and preparation cannot be designated as particularly dangerous. Of his patients with arteritis the author lost one because of embolus and two because of postoperative pneumonia. The most frequent complication in eight instances was postoperative circulatory shock. In one such case which was accompanied by disquieting symptoms of angina pectoris and pulmonary edema the condition was controlled by an injection of novocain into the stellate ganglion. These circulatory disturbances are attributed to a special lability of the sympathetic nervous system and blood letting is recommended especially for their treatment.

Paralyses or other functional discrepancies on the part of bladder, intestine, or sexual organs were not observed in a single case. Some of the patients operated upon believed that they experienced in themselves a gratifying rejuvenation.

In the matter of the function of the sympathetic nervous system, the Langley-Koelliker theory of separation into a sympathetic and a parasympathetic antagonistic system is rejected and a unitary theory is adopted, in which the entire sympathetic system is conceived as a gigantic syncytium, spreading net-like throughout the entire body and the entire nervous system and in whose peripheral composition the sympathetic trunk with all its branchings, the vagus, and the whole of the cerebrospinal nerves take a part. Each organ is provided with peripheral nerve centers, located in its terminal plexus, which are responsible for the acceleration or retardation of the organ's functioning. Following separation from the higher centers these centers are the bearers of the autonomy by which the organ continues to live and function. If the peripheral centers are detached from the higher centers by means of surgical division of the conduction paths, they are withdrawn from the inhibitive effects of the central nervous system. The emancipated peripheral centers respond with a marked, active vasodilatation as evidence of intense irritation. This condition returns after a few weeks to a moderate degree of tonus, though still somewhat altered from the original condition. All the ganglia and other peripheral centers have the character of reflex centers, independent within their own territory and capable under certain conditions of throwing back again, without participation of the higher centers, the stimuli pouring in from the periphery. Langley's hypothetical axon reflexes are in reality true peripheral reflexes.

The task of surgery of the sympathicus is the removal of the diseased centers, the interruption of pathological reflexes, and the removal of the peripheral center from under the domination of an abnormal tonus and placement under a new, autonomic tonus. A special section is devoted to the results obtained by the author in the treatment of diseases in the lumbosacral region of the sym-

pathicus. The extremely rare Raynaud's disease of the lower extremities, even in its most severe forms, may be cured by periarterial sympathectomy and resection of the sympathetic trunk. The same is true also of erythromelalgia. In arteritis obliterans, of one or both legs, resection of the sympathetic trunk is indicated, and the results from lumbosacral sympathectomy are essentially better than those from lumbar sympathectomy alone. Of 96 patients, approximately 47 per cent recovered permanently and were completely able to resume their work, while 42 per cent received no benefit whatever from the treatment. In 24 patients with arteritis widely extended throughout the vascular system, the left suprarenal gland was extirpated, and in 16 of them an additional thoracosolar sympathectomy was done. By this means good results were obtained in 56 per cent of the patients. In 11 patients with locally circumscribed arteritis, arterial resection was undertaken.

Under the designation "generalized dystonia," a morbid condition in a girl of seventeen years was described, wherein slowly progressive failure of the total smooth musculature resulted ultimately in death. The cause was found to be a degenerative disease of all the sympathetic ganglia. There are also reported 2 cases of high blood pressure which were cured by extirpation of the left suprarenal gland together with thoracosolar sympathectomy.

The author then discusses the physiology and pathology of the plexus coeliacus together with the possibilities of surgically attacking this section of the nervous system. This discussion is of importance also for other pathological conditions, as for instance, gastric ulcer.

In conclusion there is a discussion of the pathogenesis and surgical treatment of megacolon, painful and functional diseases of the pelvic organs, amputation-neuroma, causalgias, hyperhidrosis, cutaneous diseases, trophic ulcer, and reflex dystrophies of the extremities. With the last group acute osseous atrophy, traumatic edema, traumatic arthritis and peri-arthritis, and arthritis deformans are also discussed.

(H W PAESSLEP). JOHN W. BRENNAN, M D

SURGERY OF THE THORAX

CHEST WALL AND BREAST

Livraga P. Ovarian Hormones In the Etiology of Cystic Mastitis (Gli ormoni ovarici nella eziologia della mastopatia cistica) *Clin chir* 1937 13 291

The author studied the effects of small repeated doses of folliculin and lutein over considerable periods on the mammary glands of adult virgin rats. The first series of forty five animals was given six rat units of cristalovar daily for the first sixty days twelve units for the same period and twenty four for the next four months. At the end of the first month the glands showed no special differences from the controls. At the end of four months and still more marked after eight months, there was a notable dilatation of the entire duct system with a diffuse adenomatous proliferation of the glandular epithelium. The cells were entirely normal in appearance. There was a slight secretion and the connective tissue showed a moderate number of fibroblasts and a mild eosinophilic infiltration. Two months after the injections were stopped these changes had regressed and left only a slight increase of connective tissue.

A second series of thirty rats was given 0.3 c cm of luteal daily for the first two months 0.5 c cm for the same period and 1.0 c cm for the succeeding four months. Beginning with the first month there was an increasing, uniform diffuse hypertrophy of the gland tissue with marked secretion accompanied by dilatation of the ducts, conspicuous hyperemia and edema of the connective tissue. There was no epithelial proliferation. Two months after the end of treatment the secretion had ceased and the epithelium and ducts had returned to their original appearance. The hyperemia, however, had not entirely disappeared and the connective tissue had become dense. At the periphery of the gland were some minute cysts lined with flattened epithelium and filled with secretion.

These findings certainly bear little resemblance to cystic mastitis. Nevertheless in view of the clinical evidence it may be considered that in this case there is an ovarian dysfunction which results in a disturbance of the normal cycle with a shortening of the resting phase. Possibly these disturbances are due to biochemical changes in the ovarian hormones or to interference with other hormones particularly that of the anterior lobe of the pituitary with the result that the breast is subjected to conflicting proliferative and congestive secretory stimuli. Acting in a closed circle for years these stimuli may be reinforced by inflammation of the stroma which would exaggerate the tendency to cyst formation. This hypothesis does not exclude other factors.

The author has had good results in cystic mastitis from the use of folliculin. The improvement is probably functional rather than anatomical. Whether the effect is due to dilatation of the ducts which fa-

cilitates resorption of the secretion or to a modulation of the lutein phase it is impossible to say. Removal of the breast is indicated only in elderly women with a rapid atypical proliferation proved by biopsy.

The author reviews some of the important clinical and experimental literature and gives an extensive bibliography. Microphotographs accompany the article. M E Moxz MD

Moelling, E. Diagnostic Excision of the Female Breast (Die diagnostische Exzision an der weiblichen Brustdruese) *Beitr z Klin Chir* 1937 166 192

This is a lengthy article on biopsy of the female breast with a consideration of the advantages and disadvantages of the procedure. The author is of the opinion that the advantages outweigh any harm which may result. Even aside from the diagnostically doubtful cases the results frequently convince the patient and he thereby more easily consents to operation. From the standpoint of mental therapy alone the procedure may be indicated. Among functional diseases of the breast, the bleeding breast gives the chief indication for biopsy. Non specific purulent mastitis is no indication for the diagnostic excision method. Chronic cystic mastitis of the breast will often need to be clarified by biopsy and the nodular initial stage of mammary tuberculosis can be distinguished from malignant neoplasms only by this procedure. On the other hand it is seldom required for actinomycosis. Distinguishing between gumma and carcinoma may offer great difficulties and when the results of anti syphilitic treatment require too much time biopsy is to be resorted to unhesitatingly. In the presence of tumor Klose and others defend the most extensive application of biopsy however. Robert Meyer the widely experienced pathologist of the Berlin University Clinic, believes that anxiety about a subsequent malignant degeneration would lead to the sacrificing needlessly of very many breasts.

On the whole it is generally agreed that biopsy is by no means always a harmless procedure. The author discusses at length the possibility of a so-called going wild of the tumor which has been subjected to biopsy and then not removed at once operatively. Complete understanding in this matter has not as yet been attained, and eminent pathologists are of the opinion that there is no basis for believing that the tumor cells will be disseminated by the biopsy. The author's original article must be consulted for details as he refers to an extensive amount of bibliographic material. The author states that he believes the advantages of biopsy nearly always predominate over the disadvantages.

Interpretation of the tissue findings should always be left to the specialist in pathology and the patholo-

gist should be present when the operation is done in order to instruct himself as to the location and the conditions of the removal of the specimen. From the statistical standpoint the histological diagnosis is far superior to the clinical, as according to Fischer, the clinician makes a correct diagnosis in 68 per cent of the cases, while the histological diagnosis is correct in 91 per cent of all cases of tumor. In the case of the mammary gland, histological diagnosis is regarded as nearly always trustworthy. On the whole, it is generally understood that radical operation, if indicated, should immediately follow the biopsy. The opinions of the author with regard to aseptic procedures, intravenous narcosis, and electric-knife incision do not need repetition.

(VOGELER) JOHN W. BRENNAN, M.D.

Rubens-Duval, H.: Indications for Different Treatments of Cancer and of Precancerous Conditions of the Mammary Gland (Indications des différents traitements des cancers et des états précancéreux de la glande mammaire) *Bull. et mém. Soc. d. chirurgiens de Paris*, 1937, 29: 178.

Rubens-Duval states that it is generally agreed that cancer should be treated at its beginning, but the question is "When does it begin?" When cancer is recognized clinically it is fully established. The author agrees with the opinions of Delore as expressed in the latter's recent book, in which he states that cancer is the result of two factors, the predisposed tissues and the cancer-producing toxins. The development of cancer thus presents three phases: the predisposition which consists in changes that render the tissues susceptible to the cancer-producing toxins, the beginning of the latent phase during which these toxins produce little by little the pathological changes, and the period when the cancer produces clinical symptoms.

The future treatment of cancer will depend more upon prophylactic treatment in the phase of predisposition, or abortive treatment in the latent phase, than on curative treatment in the established cancer.

In the phase of predisposition, certain humoral conditions appear to predispose the tissues to cancer, the chief of which is alkalosis. Reding has studied these factors and concludes that they are largely under the control of the vegetative nervous system. Vagotomy and conditions that induce vagotonia increase the potassium content of the blood and tend to produce alkalosis. Prophylactic treatment would consist in measures to re-establish the nervous and endocrine equilibrium and to correct the disturbances that predispose to cancer. For this purpose, magnesium chloride and certain dietary regimes have been suggested.

In considering the treatment of mammary cancer in the latent period, the author notes that the sex hormones, which control the development of the mammary gland, closely resemble in some respects the cancer-producing hydrocarbons that are extracted from tar. Animal experiments have shown

that repeated injections of folliculin in large amounts can produce mammary cancer. It must be remembered, however, that the tissues in which cancer is produced are in some way predisposed. This is indicated by the fact that not all animals develop mammary cancer in experiments with folliculin, and that not all the mammary glands in the same animal are involved. Clinical observations in women indicate the same conditions, irritation of the mammary gland produces benign inflammation in some instances, and hyperplasia that may become malignant in others. Some lesions regress, others undergo malignant degeneration, even the same breast in a woman may show lesions in various stages. In the stage of precancerous lesions, the treatment should be abortive. The treatment that the author has found most effective in this stage is a form of protein therapy, with the specific globulins extracted from malignant tumors. These tumor extracts given by mouth improve the patient's general condition, the Vernes test shows that the photometric index of the blood, which has been above normal, returns to normal. The improvement in the local condition varies according to the type of the lesion present. Epithelial formations, such as adenomas, intracanalicular epitheliomas, and nodules of chronic mastitis, disappear completely, or are reduced to minimal sclerotic remnants; while cysts with a thick fibrous wall, or adenomafibromas in which the fibromatous element predominates show no definite modification. The nodules of chronic mastitis disappear slowly, and new nodules may develop if treatment is interrupted, or even in the course of treatment. In cases that prove resistant, local surgical or radiation treatment is of value to remove or destroy large masses. The protein therapy should be continued to modify the glandular activity that tends to reproduce the lesions that are susceptible of malignant degeneration. The therapeutic effect of the administration of the tumor extracts by mouth may be increased by intradermal injection of the extracts.

When the cancer reaches the stage in which there is clinical and histological evidence of malignancy, the disease is then of long standing, years may have passed between its actual and its apparent beginning. At this time, general treatment is not sufficient; either surgery or radiotherapy for the removal or destruction of the local growth becomes necessary. The predisposition to cancer is not affected by the removal of the local tumor; therefore, the treatment with tumor extracts should still be carried out. This form of protein therapy is especially valuable as an adjunct to radiotherapy as it renders the tumor cells more "fragile" and therefore more radiosensitive. If tumor cells escape either surgical removal or destruction by radiation, they disappear if protein therapy is continued for a long period.

In cancer of the breast of the first grade of Steinhil's classification, radical operation has been regarded as the treatment of choice, protein therapy

SURGERY OF THE THORAX

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bacilli are being disseminated to others. Therefore, more patients are being found who are the best subjects for treatment by means of artificial pneumothorax.

When artificial pneumothorax can be successfully administered in the ambulatory patient, it embraces the three essentials in the treatment of pulmonary tuberculosis: (1) checking the spread of the disease, (2) conversion of positive to negative sputum; and (3) restoration of the patient's working capacity in the shortest possible time.

The author believes that when the disease is found in the early stage and is known to be progressive, artificial pneumothorax should be instituted at once. Bed rest alone, he believes, permits the progression of the disease in far too many patients to justify its exclusive use. In all patients with unilateral progressive disease in the moderately or far advanced stage artificial pneumothorax should be attempted, provided there is no special contra-indication.

In most patients with early unilateral tuberculosis, many with moderately advanced unilateral disease, and some with far advanced unilateral disease, artificial pneumothorax may be safely undertaken on the ambulatory basis, that is, with no period of strict bed rest up to a period of three months of bed rest.

Carefully administered artificial pneumothorax on the side of the more extensive lesion may be of great benefit even when bilateral disease exists. In some instances partial bilateral pneumothorax is helpful. When a lesion makes its appearance in the contralateral lung which was previously clear, and shows evidence of progressiveness, treatment may be discontinued on the side of the original disease provided it is well controlled, otherwise bilateral artificial pneumothorax may be indicated.

In no patient whose cavities are not adequately closed after artificial pneumothorax has been given an adequate trial should this treatment be continued because of danger of spreading the disease to the opposite lung and the risk of hemorrhage and empyema. The treatment should be discontinued and surgery should be undertaken.

EARL O. LATIMER, M.D.

Freedlander, S. O., and Wolpaw, S. E.: A Control Group for Studying the End-Results of Thoracoplasty. An Analysis of the Course of Those Patients Refusing Operation. *J. Thoracic Surg.*, 1937, 6: 477.

From 1932 to 1934 inclusive, 153 patients in Cleveland hospitals and sanatoria were selected for thoracoplasty. Eighty-five accepted operation and 58 refused it. The remaining 10 refused at first, but after from one to three years consented to operation. The decisions as to therapy were made by the same group of physicians, and the thoracoplasties were all performed by the same group of surgeons. A follow-up study was made on 114 of the 125 surviving patients during the first three months of 1936.

In determining the physical status of the patient the terms, "closed," "improved," "unchanged," "worse," and "dead" were used. The "closed" group included only those who had persistently negative sputum, x-ray evidence of a healed or retrogressive lesion without evidence of cavitation, and absence of constitutional symptoms. A further classification was followed dividing the patients into a "good chronic" group and into a "slipping chronic" group. The term "good chronic" was applied, according to the criteria of Brown and Sampson, to patients who had a cavity of 2 cm. or larger, whose general condition was good and who, over an observation period of several months, had a normal temperature and pulse, a good appetite, and no significant loss of weight, and were able to take some exercise. Sputum might be present and contain tubercle bacilli. Roentgenograms of the chest showed no evidence of a progressive lesion. All patients who failed to qualify for this group were termed "slipping chronics."

In comparing the results of the two main groups it was found that 48 (57 per cent) of the thoracoplasty cases and only 6 (10 per cent) of the control cases were closed. The mortality among the thoracoplasty group was 14 per cent, that of the controls 26 per cent. When the intermediate groups were combined with the extremes it was found that 66 per cent of the thoracoplasty cases and only 17 per cent of the control group were closed or improved. In 21 per cent of the thoracoplasty cases and 61 per cent of the controls the condition was worse, or the patient had died.

When the groups were divided into the categories of "good chronics" and "slipping chronics" the differences were again striking. In the "slipping chronic" group with 42 thoracoplasty cases and 26 controls, 43 per cent of the former and only 4 per cent of the latter were closed cases. The mortality was 17 and 35 per cent respectively. Fifty-seven per cent of the thoracoplasty cases and 8 per cent of the control were closed or improved. In 29 per cent of the thoracoplasty cases and 77 per cent of the controls the condition was worse, or the patient had died.

In the "good chronic" group with 43 thoracoplasty cases and 32 control cases, 70 per cent of the former and 16 per cent of the latter were closed. The mortality was 12 and 19 per cent respectively. Seventy-five per cent of the thoracoplasty cases and 25 per cent of the control cases were closed or improved. In 14 per cent of the thoracoplasty cases and 47 per cent of the controls the condition was worse, or the patient had died.

In defining the functional status of the patients three terms were used, "able to work," "well but unable to work," and "curing." The "able to work" group includes all cases which are closed or improved, or have been unchanged in the control group, those in which the patients are able to work full or part time and not undergoing treatment. The "well but unable to work" group includes cases

is a valuable adjunct to radical operation but it does not render it less mutilating. It is an especially valuable adjunct to other forms of local treatment and especially to radium puncture. The insertion of radium needles into the tumor. This method of radium treatment has been successfully developed for the treatment of the cancer of the tongue. It is the author believes equally suitable for the treatment of cancer of the breast and is much better tolerated in breast lesions. If employed alone and limited to the tumor dissemination of the cancer cells is not certainly prevented therefore protein therapy is valuable as an adjunct.

In cases of breast cancer, in which operation was contra indicated on account of the general condition of the patient not on account of the extent of the lesion the author has had as good results with radium puncture and protein therapy as are obtained in tumors of the same grade with radical operations and without mutilation. In cases of tumors of the breast that are highly metastatic diathermocoagulation or radiation at a distance may be indicated but in most cases the author is convinced that radium puncture is more effective. This form of radium therapy gives a continuous radiation with little discomfort to the patient. Radium puncture might also in some instances result in cure of cancer of the breast but the author does not recommend its use except in conjunction with protein therapy which can be prolonged for as long a time as necessary.

In cases of involvement of the glands the second grade of malignancy according to Steinthal treatment must depend on the type of gland involvement. If there is only one enlarged gland situated low in the armpit this gland may be treated by the insertion of radium needles. If there are several small glands high in the armpit and movable they should be removed surgically. In cases of higher grades of malignancy in which the skin is extensively involved and surgical removal is impossible radium puncture is the treatment of choice but in these cases axillary and subclavicular glands may be involved that cannot be treated by this method. Deep x ray therapy might be effective in these cases but the author has found that this form of radiation after radium puncture may cause too severe a reaction and exhaust the patient. He hesitates to recommend it for this reason although it is indicated theoretically.

In acute cancer of the breast or carcinomatous mastitis in young women the author advises protein therapy with tumor extracts to stimulate the defense reactions of the organism combined with x ray therapy to destroy the local carcinomatous cells. In three cases in which he has used this method the tumor disappeared entirely.

In scirrhous cancer in aged women radium puncture is the only effective form of radiotherapy as it acts not only on the cancer cells but also on the sclerotic tissue. Protein therapy is then more effective when the sclerotic tissue has been ren-

dered more responsive to its action by the effect of the radium.

In intracanalicular dendritic epithelioma protein therapy alone may relieve the discharge from the nipple which is the chief symptom but its action is very gradual and it is best supplemented by x ray therapy. In Paget's disease of the breast when limited to the nipple and areola the author prefers radium puncture combined with protein therapy to radiation with the x rays.

In cases of ulcerating cancer the first indication is the destruction of the ulcerating mass thus the author believes, can best be done by diathermocoagulation that is true coagulation and not the cutting current. It may be completed by the use of radium either for irradiation at a distance or radium puncture according to the case. Protein therapy which so frequently improves the general condition of the patient is especially indicated in the cases.

ALICE M. MEYER

TRACHEA, LUNGS AND PLEURA

Gibson J H Jr. Artificial Maintenance of Circulation During Experimental Occlusion of the Pulmonary Artery. *Arch Surg* 1937 34 1102.

This paper describes a mechanical device used as a substitute heart and lungs during occlusion of the pulmonary artery in the cat for periods as long as two and one half hours. One leg of the apparatus connects to the jugular vein of the animal thence to a suction pump and from there the blood is run down in a thin film in a cylinder where it comes in contact with 95 per cent oxygen and 5 per cent carbon dioxide mixture. After being thus oxygenated the blood collects in a reservoir from which it is pumped back into the femoral artery of the animal. During the experiment the blood is prevented from coagulating in the apparatus by giving the animal large doses of heparin.

The author was able to occlude completely the pulmonary artery of the cat and maintain the blood circulation and oxygenation for a period of two and one half hours. The blood pressure was maintained at almost normal level.

The animals were kept alive for several hours after the pulmonary artery was released but because of the difficulties in using sterile technique and operative difficulties on the cat the author was unable to get a complete recovery. In one experiment the pulmonary artery was not exposed and clamped when the apparatus was used and the animal lived for five days.

J. DANIEL WILLEMS M.D.

Myers J A. Artificial Pneumothorax with Particular Reference to the Ambulatory Patient. *J Thoracic Surg* 1937 6 513.

Modern methods of diagnosis have made it possible to detect progressive chronic pulmonary tuberculosis in the presymptom stage when the patient is in good general health and often before tubercle

bacilli are being disseminated to others. Therefore, more patients are being found who are the best subjects for treatment by means of artificial pneumothorax.

When artificial pneumothorax can be successfully administered in the ambulatory patient, it embraces the three essentials in the treatment of pulmonary tuberculosis. (1) checking the spread of the disease, (2) conversion of positive to negative sputum, and (3) restoration of the patient's working capacity in the shortest possible time.

The author believes that when the disease is found in the early stage and is known to be progressive, artificial pneumothorax should be instituted at once. Bed rest alone, he believes, permits the progression of the disease in far too many patients to justify its exclusive use. In all patients with unilateral progressive disease in the moderately or far advanced stage artificial pneumothorax should be attempted, provided there is no special contra-indication.

In most patients with early unilateral tuberculosis, many with moderately advanced unilateral disease, and some with far advanced unilateral disease, artificial pneumothorax may be safely undertaken on the ambulatory basis, that is, with no period of strict bed rest up to a period of three months of bed rest.

Carefully administered artificial pneumothorax on the side of the more extensive lesion may be of great benefit even when bilateral disease exists. In some instances partial bilateral pneumothorax is helpful. When a lesion makes its appearance in the contralateral lung which was previously clear, and shows evidence of progressiveness, treatment may be discontinued on the side of the original disease provided it is well controlled, otherwise bilateral artificial pneumothorax may be indicated.

In no patient whose cavities are not adequately closed after artificial pneumothorax has been given an adequate trial should this treatment be continued because of danger of spreading the disease to the opposite lung and the risk of hemorrhage and empyema. The treatment should be discontinued and surgery should be undertaken.

EARL O. LATIMER, M.D.

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In defining the functional status of the patients three terms were used, "able to work," "well but unable to work," and "curing." The "able to work" group includes all cases which are closed or improved, or have been unchanged in the control group, those in which the patients are able to work full or part time and not undergoing treatment. The "well but unable to work" group includes cases

which are closed or improved but in which the patients are functionally incapacitated by diminished vital capacity, weakness or fatigability. The 'curing' group includes all of the remaining cases

PRESENT FUNCTIONAL STATUS OF THE COMPLETE THORACOPLASTY AND CONTROL GROUPS

	Thoracoplasties 83 Patients		Controls 58 Patients	
	No.	Percent	No.	Percent
Able to work	42	42	26	45
Well but unable to work	8	9	1	2
Curing	19	23	28	48

a. Seven patients (9 per cent) working full or part time

b. Three patients (5 per cent) working full or part time

PRESENT FUNCTIONAL STATUS OF THE "GOOD CHRONICS" AND "SLIPPING CHRONICS"

	Thoracoplasties				Controls			
	Good Chronics 43 Patients		Slipping Chronics 41 Patients		Good Chronics 32 Patients		Slipping Chronics 26 Patients	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Able to work	74	63	33	31	26	75	64	4
Well but unable to work	2	5	6	14	2	3	0	0
Curing	6	14	12	29	15	47	13	5

a. Eleven patients (26 per cent) working full or part time

b. Five patients (12 per cent) working full or part time

c. Two patients (5 per cent) working full or part time

d. One patient (4 per cent) working part time

The 10 patients who at first refused thoracoplasty and then after from one to three years accepted the operation have been followed for too short a time to allow final evaluation of the results. However, not only was the time of their active treatment extended for from one to three years but in half of the cases the risk of operation was definitely increased and the possibility of recovery definitely lessened.

The authors conclude that without thoracoplasty the course of the disease in the good chronics is different from that in the slipping chronics but that thoracoplasty notably improves the prognosis of each group both in regard to the healing of the disease and in the restoration of work capacity. It is emphasized that to delay operation in the good chronic in the hope of 'spontaneous recovery' is unjustifiable.

Richard H. Meade, Jr.

Anderson, R. S. and Alexander, J. Closed and Open Intrapleural Pneumonolysis Results in 111 and 29 Cases Respectively. *J. Thoracic Surg.* 1937 6: 502

This article is a detailed analysis of the results obtained in a group of 111 patients for whom the authors used the closed method of pneumonolysis

between 1927 and 1934. Included is also a report of their series of 29 cases of open pneumonolysis performed between 1930 and 1934.

In the operation of closed intrapleural pneumonolysis, the proportion of cases in which all adhesions can be safely divided depends upon the nature of the adhesions and the experience skill and patience of the surgeon rather than upon the type of instrument used. The authors prefer the two-piece galvanocautery of the Jacobatus Unverricht type.

Experience shows that relatively few pneumothorax patients have adhesions that are suitable for intrapleural pneumonolysis. During a five year period at the Michigan State Sanatorium these operations were applied to 14.8 per cent of all pneumothorax cases. Among the 111 patients the adhesions were completely divided in 37 per cent, incompletely in 41.4 per cent, and were found at operation to be not suitable for division in 21.6 per cent. Intrapleural pneumonolysis may be done in preference to phrenic paralysis in the following types of cases: (1) when the adhesion that is apparently suitable for division immediately overlies a soft actively progressing lesion, especially one that includes a superficial cavity, (2) when the adhesion exerts a horizontal pull upon the lesion, and (3) when active lesions in the contralateral lung may require phrenic paralysis.

Operative complications were not present and postoperative complications were few. A variable degree of temporary emphysema of the thoracic wall was a constant postoperative finding. In one case air continued to escape as fast as it could be introduced and the pneumothorax failed. Transient serous effusion occurred in 29.9 per cent of the cases, persistent effusion in 9.9. A pure tuberculous empyema followed the operation in 3.6 per cent of the cases, a mixed tuberculous and pyogenic empyema in 3.8 per cent.

The results from intrapleural pneumonolysis should be considered from three angles: (1) the technical success in the division of the adhesions, (2) the effect upon the lung, (3) the effect upon the patient. Intrapleural pneumonolysis is not an end in itself but is used to produce a satisfactory pneumothorax. Complete technical success in the division of the adhesions does not therefore assure the recovery of the patient. On the other hand, incomplete division of the adhesions may permit a sufficient pulmonary collapse by pneumothorax to heal the lesions. The effect of the operation upon the patient depends not only on the effect upon the lung on the side operated upon but also on the subsequent behavior of the lesions that may be present in the other lung and upon the patient's general response to treatment.

Open intrapleural pneumonolysis is valuable for a small group of patients who have adhesions are too short or too complex in arrangement for safe division by the closed method. An open operation may be used for bilateral tuberculosis when a thoracoplasty is definitely contra-indicated. This operation should be reserved for those patients in whom

phrenic paralysis, if indicated, and closed intrapleural pneumonolysis have already been tried, and in whom thoracoplasty is contra-indicated, and for whom the open operation offers the only chance for recovery.

J DANIEL WILLEMS, M D

Debré, R., Marie, J., Mignon, M., and Bidou, S.: A Congenital Pulmonary Cyst in a Nursling. Infection of the Cyst in the Course of an Attack of Measles. Progressive Extension of the Cyst Simulating a Chronic Pneumothorax (Kyste congénital du poumon chez un nourrisson. Infection du kyste au cours d'une rougeole. Extension progressive du kyste simulant un pneumothorax chronique). *Bull. et mém. Soc. méd. d'hop. de Par.*, 1937, 53, 531.

An infant fourteen months old was hospitalized with a typical case of measles. By the seventh day dullness was discovered over the lower half of the right lung. A radiogram revealed the entire right thorax to be opaque except for two rounded clear places in the upper portion. Ten days later the picture was that of a hydropneumothorax. This process, followed by means of a series of radiograms, gradually cleared and gave place to two rounded areas of reduced density having polycyclic borders. These were obviously pulmonary cysts. Although the patient recovered clinically there was a rapid increase in the size of the cysts, which, in a period of eight months, came to occupy the greater part of the right chest.

Congenital cysts of the lung may exist silently until infected in the course of some acute disease. At this time they are readily mistaken for an abscess or a pyopneumothorax. Under the influence of the infection the cysts may rapidly increase in size so that after resolution of the inflammatory process, the picture may closely resemble that of a chronic pneumothorax. The absence of a pulmonary stump in the radiogram is the chief point in identifying the lesion as a cyst.

ALBERT F. DE GROAT, M D

Liverani, E., and Magno, N.: Bronchiectasis of the Upper Lobes (Le bronchiectasi dei lobi superiori). *Minerva med.*, 1937, 28, 461.

Clinicians generally agree that disease of the upper lobes of the lungs is tuberculous and that bronchiectasis occurs chiefly in the lower lobes. Nevertheless, bronchiectasis of the upper lobes is not as rare as it is generally supposed. In support of this opinion the author describes and illustrates with roentgenograms twelve cases of bronchiectasis of the upper lobes.

It is true that there are anatomical conditions that tend to make bronchiectasis more frequent in the lower lobes: the conditions for drainage of the bronchi are not so good in the lower lobes and pleural adhesions exercise a stronger traction in the lower lobes than in the upper. Except for these all the causes that act to produce bronchiectasis are as active in the upper lobes as in the lower.

Bronchiectases may be divided into three groups: (1) those from endobronchial causes, such as foreign

bodies, bronchopneumonia in childhood from grip, scarlatina, measles, slow and incomplete resolution of pneumonia and bronchopneumonia, chronic bronchitis with retention, and sequelæ of inhalation of caustic gases; (2) extrabronchial, such as traction from sclerosis of the lungs, (3) idiopathic, most of these are believed due to congenital syphilis.

Treatment is not very effective. Pneumothorax should be tried when it is possible, but it is often not possible on account of pleural adhesions. In that case the ordinary balsamic and climatic treatment must be used, together with what is called the morning bronchial toilet. This consists in the patient finding out by experiment what position and what movement will provoke cough on first waking in the morning and empty the bronchi. This symptomatic treatment has given very good results. The other usual treatments, except lobectomy, which is quite dangerous, can do no more than improve the inflamed condition of the dilated walls, but cannot reduce the size of the dilated bronchi or restore the lost elasticity of the walls. The prognosis of bronchiectasis of the upper lobes is much better than that of the lower lobes, if for no other reason than that the patient can expel the secretion more readily.

AUDREY GOSS MORGAN, M D.

Holman, E.: Partial Resection of the Lower Scapula as an Aid in Compressing Apical Tuberculous Abscesses and in Conserving Vital Capacity. *J. Thoracic Surg.*, 1937, 6, 496.

When it is found that a partial thoracoplasty will suffice to produce collapse of an apical, tuberculous abscess, it is desirable to do it with conservation of the greatest amount of normal lung. An effective temporary collapse can usually be obtained by a sufficiently radical resection of the overlying ribs, but unless the dead space so created can be obliterated, there will later be a partial re-expansion of the underlying lung. If enough ribs are resected the scapula will fall in and maintain the collapse. However, ordinarily excision of the posterior part of the ribs down through the seventh is required. If resection of a smaller number of ribs will allow for collapse of the involved area, then a further removal of ribs to allow the scapula to fall in will needlessly sacrifice normal respiratory tissues. Furthermore, if the scapula cannot fall in, its lower angle will ride on the underlying ribs and frequently cause localized pain and elevate the shoulder.

Holman offers a simple procedure to allow for adequate and permanent local collapse with sacrifice of a minimum amount of normal lung tissue. This procedure calls for a subperiosteal resection of enough of the lower part of the scapula to allow it to fall in and fill the dead space created by the rib resection. An incision is made around the angle of the scapula, the attached muscles and periosteum are elevated, and the denuded bone is removed with rongeurs. Resection is carried to an extent that will allow the scapula to fall easily into the space provided by the rib resection.

which are closed or improved, but in which the patients are functionally incapacitated by diminished vital capacity, weakness or fatigability. The 'curing' group includes all of the remaining cases.

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	Thoracoplasties 87 Patients		Controls 25 Patients	
	No.	Percent	No.	Percent
Able to work	40 a	47	9 b	36
Well but unable to work	2	2	2	8
Curing	19	22	14	56

a. Sixteen patients (19 per cent) working full or part time.

b. Three patients (12 per cent) working full or part time.

PRESENT FUNCTIONAL STATUS OF THE "GOOD CHRONICS" AND "SLIPPING CHRONICS"

	Thoracoplasties				Controls			
	Good Chronics 43 Patients		Slipping Chronics 43 Patients		Good Chronics 5 Patients		Slipping Chronics 20 Patients	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Able to work	27 a	63	13 b	31	5 c	100	10	50
Well but unable to work		5	6	14	1	20	0	0
Curing	6	14	13	31	3	60	10	50

a. Eleven patients (26 per cent) working full or part time.

b. Five patients (12 per cent) working full or part time.

c. Two patients (40 per cent) working full or part time.

d. One patient (20 per cent) working part time.

The 10 patients who at first refused thoracoplasty and then after from one to three years accepted the operation have been followed for too short a time to allow final evaluation of the results. However, not only was the time of their active treatment extended for from one to three years but in half of the cases the risk of operation was definitely increased and the possibility of recovery definitely lessened.

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AUDREY GOSS MORGAN, M.D

Holman, E.: Partial Resection of the Lower Scapula as an Aid in Compressing Apical Tuberculous Abscesses and in Conserving Vital Capacity. *J. Thoracic Surg*, 1937, 6 496.

When it is found that a partial thoracoplasty will suffice to produce collapse of an apical, tuberculous abscess, it is desirable to do it with conservation of the greatest amount of normal lung. An effective temporary collapse can usually be obtained by a sufficiently radical resection of the overlying ribs, but unless the dead space so created can be obliterated, there will later be a partial re-expansion of the underlying lung. If enough ribs are resected the scapula will fall in and maintain the collapse. However, ordinarily excision of the posterior part of the ribs down through the seventh is required. If resection of a smaller number of ribs will allow for collapse of the involved area, then a further removal of ribs to allow the scapula to fall in will needlessly sacrifice normal respiratory tissues. Furthermore, if the scapula cannot fall in, its lower angle will ride on the underlying ribs and frequently cause localized pain and elevate the shoulder.

Holman offers a simple procedure to allow for adequate and permanent local collapse with sacrifice of a minimum amount of normal lung tissue. This procedure calls for a subperiosteal resection of enough of the lower part of the scapula to allow it to fall in and fill the dead space created by the rib resection. An incision is made around the angle of the scapula, the attached muscles and periosteum are elevated, and the denuded bone is removed with rongeurs. Resection is carried to an extent that will allow the scapula to fall easily into the space provided by the rib resection.

According to the patient's condition and the conditions found at operation the scapula is resected at the first or second stage. As five ribs must ordinarily be resected to allow even the smaller sized scapula to fall into the dead space this additional resection is usually carried out at the second stage operation. Active paradoxical movements of the mobilized chest wall are always a menace and in cases in which the risk is great they may prove fatal. The falling in of the scapula largely counteracts this danger and in such cases further resection of the ribs and scapula may be indicated.

RICHARD H. MEADE JR.

Sergeant E. Fourestier M and Duperrat B.
Bronchial and Esophageal Stenosis Caused by
Cancer of the Lung (Sténose bronchique et esopha-
gienne par cancer du poulmon. La forme polysténo-
sante du cancer du poulmon). *Ann. med-chir.* Par.
1937 2 107

A case history is cited which illustrates the combined stenosis that occasionally results from cancer of the lung. A male patient sixty nine years old had suffered from a productive cough and progressive loss of weight for about a year. When he came under observation there was a left encysted empyema with pneumothorax and massive atelectasis. Radiographic examination revealed a stenosis of the left primary bronchus which by bronchoscopy proved to be due to extrinsic pressure. Because of dysphagia an endoscopic examination was performed. This also showed a stenosis due to an extrinsic cause. The stenosis eventually necessitated a gastrostomy. Death followed soon after.

The cause of the double obstruction was assumed to be a primary non bronchiogenic carcinoma of the lung. The diagnosis was not cleared up by autopsy. Similar cases have been reported by Rist in 1926, Huguenin in 1928, Creysseil in 1930 and Rendu in 1933.

LIBERT I. DE GROOT M.D.

HEART AND PERICARDIUM

Freedman E. The Roentgenological Diagnosis of Cardiac Compression Due to Pericardial Scar (Adhesive Pericarditis). *Am. J. Roentgenol.* 1937 37 739

Since cardiac compression due to a pericardial scar has become accessible to surgery the early establishment of the correct diagnosis is very essential and may be made by clinical and roentgenological examinations. Consideration is given to the cause, pathology, clinical symptoms and treatment as well as to the roentgenological aspects of the condition. In discussing the pathology emphasis is placed on the fact that the symptoms and roentgen findings may be accounted for mainly by compression on the heart due to rigidity of the pericardium with or without adhesions. Attention is called to the confusion regarding the nomenclature of the condition and the terms used by various authors who have described it are mentioned together with the disadvantages of

those terms. It is believed that Beck's compression of the heart due to pericardial scar conveys the essential features of the disease both from the standpoint of pathology and physiology and if generally accepted, might obviate the present confusion.

This article is based on fourteen cases all of which came to operation. In three of the four patients who died within twenty four hours after operation a complete autopsy was made. Roentgenological studies made by others in connection with the conditions are reviewed.

In the roentgenological investigation of clinically suspected or diagnosed case the following are observed: (1) the heart shadow and the cardiac configuration; (2) the presence or absence of pulsations lately supplemented by additional kymographic studies; (3) the changes of the configuration of the heart in the inspiratory and expiratory phase with the patient in the erect position; (4) the mediastinal excursions in the left or right lateral recumbent position during inspiration and expiration; (5) the change of relationship of the anterior border of the heart with the sternum during inspiration and expiration; (6) the appearance of the retrocardiac space as seen in the lateral view; (7) the appearance of the diaphragm and its relationship to the heart shadow and (8) the calcification of the pericardium. Recently additional kymographic studies have been made to aid in determining the pulsation.

All of these points are discussed in detail in a general way and also in connection with the cases studied. Several case histories are cited at length to illustrate some of the clinical and roentgenological features of the compressed heart and numerous illustrations are included.

The following conclusions are drawn:

The roentgen diagnosis of cardiac compression due to pericardial scar tissue formation is made by the utilization of several signs, the most conclusive of which is the pericardial calcification. Aside from the latter, only the finding of several of the individual signs justifies an unequivocal diagnosis. The roentgenoscopic examination is of greater importance than the roentgenographic because important respiratory changes in the position and configuration of the heart and diaphragm can be elicited with ease. The knowledge of the clinical history is important because it leads to a search for some of the signs which are not obvious and have to be sought. One of the most important signs is the marked discrepancy between the clinical symptoms of cardiac decompensation and the absolutely or relatively small shadow of the heart. A marked enlargement of the cardiopericardial shadow is rare.

The cardiac configuration is variable. The triangular shaped heart is common while an abnormal bulging on either the left or right contour is found also. The cardiac pulsations are abnormal. They are either diminished in amplitude or absent throughout the entire heart or throughout certain sections as shown by roentgenoscopic observations and kymographic studies. Similarly abnormal pulsations

can be found in pericardial effusions and in cases of decompensation due to cardiac dilatation. However, the compressed heart is rarely large enough to suggest either of these two conditions

The lack of plasticity and the presence of fixation of the heart are determined by examination during the inspiratory and expiratory stage with the patient in erect postero-anterior and lateral positions and in both lateral recumbent positions in postero-anterior direction

Calcification of the pericardium, which is one of the most conclusive single signs, is present only in the minority of cases ADOLPH HARTUNG, M D

Pilcher, R. • Pericardial Resection for Constrictive Pericarditis *Lancet*, 1937, 232 1323

The author reports his results one year after a pericardial resection for constrictive pericarditis. The patient was a female who had been observed over a period of six years. A diagnosis of constrictive pericarditis was made shortly before the operation. During the six years of observation her abdomen had been tapped forty-two times, and a total of 402 pts of fluid had been withdrawn.

The operation was performed under intratracheal nitrous-oxide-oxygen-ether anesthesia. The sternum was divided transversely at the second intercostal space and the distal portion longitudinally. The xiphisternum was excised. The left ventricle was freed first, then the right. Calcified material over the auricles prevented complete stripping of these parts.

The postoperative course was uneventful. The ascites did not disappear spontaneously. Paracentesis was performed three times following the operation, and the abdomen has not become distended again. Following the administration of thecalcin the urinary excretion was markedly increased. The patient has remained well and able to work since being discharged from the hospital.

EARL O LATIMER, M D

ESOPHAGUS AND MEDIASTINUM

Jonsson, G. • Notes on the Roentgen Picture of the So-Called Esophagus Lip. *Acta radiol*, 1937, 18 452

Roentgen examination of the hypopharynx and upper part of the esophagus frequently reveals a rounded bulging in the posterior wall immediately below the cricoid cartilage. In the roentgenological literature such findings have been considered as the indirect signs of the presence of foreign bodies. Inasmuch as such bulges occur also when there is no foreign body, it seems to the author that they probably represent normal variations.

In order to gain more convincing evidence for this assumption, fifty normal cases were investigated. No fewer than eighteen cases of this series presented this bulge between the hypopharynx and the esophagus. It extended for about 1 cm and varied in position in accordance with the location of the larynx. Its con-

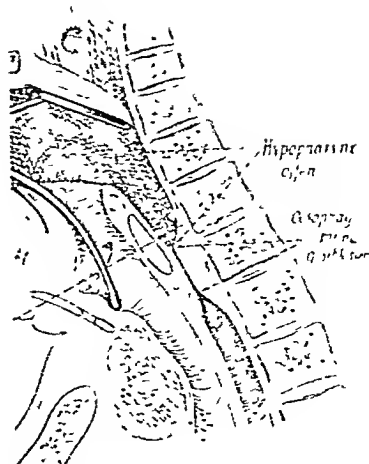


Fig 1 The hypopharynx open and the esophagus mouth closed

stancy even on repeated examinations indicated that it was due to fairly constant anatomical circumstances.

The author believes that the anatomical basis for this variation is in conformity with Killian's contention that there is a physiological borderline between the hypopharynx and the esophagus. The lower part of the inferior pharyngeal constrictor muscle issues from the sides of the cricoid cartilage and encloses the hypopharynx laterally and posteriorly. According to Killian, that part called the cricopharyngeal muscle consists, in its turn, of two parts, an upper, the pars obliqua, and a lower, the pars fundiformis. This latter part runs obliquely downward

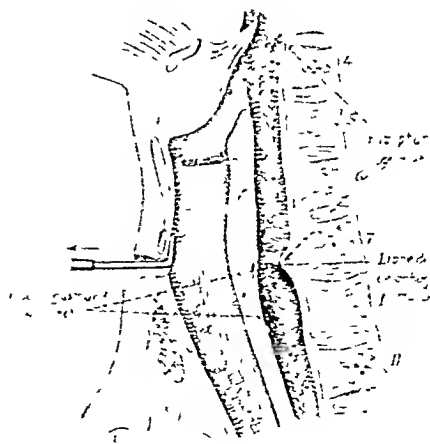


Fig 2 The hypopharynx and esophagus mouth open, showing the esophagus lip

According to the patient's condition and the conditions found at operation the scapula is resected at the first or second stage. As five ribs must ordinarily be resected to allow even the smaller sized scapula to fall into the dead space this additional resection is usually carried out at the second stage operation. Active paradoxical movements of the mobilized chest wall are always a menace and in cases in which the risk is great they may prove fatal. The falling in of the scapula largely counteracts this danger and in such cases further resection of the ribs and scapula may be indicated.

RICHARD H. MEADE, JR.

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EARL O LATIMER, M D

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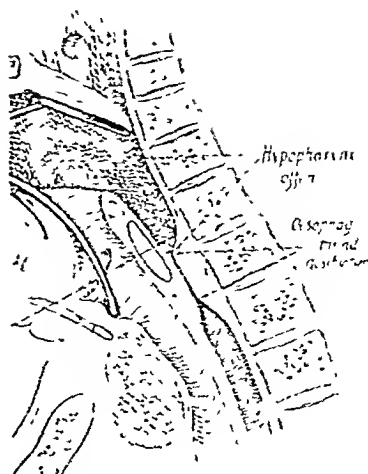


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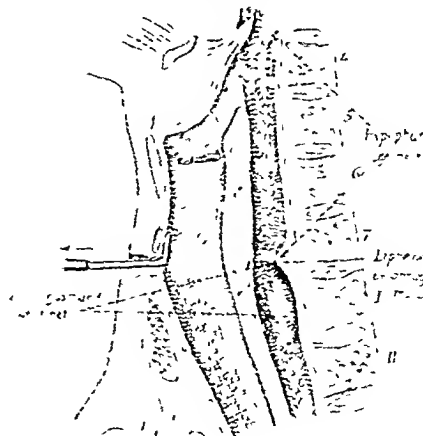


Fig 2 The hypopharynx and esophagus mouth open, showing the esophagus lip

and backward and it is this part which acts as a sphincter and produces the lip-shaped bulging in the posterior wall which has been given the name of esophagus lip

Another circumstance which proves the topographical agreement of the bulging with the pars fundiformis of the cricopharyngeal muscle is the localization of the pulsion diverticula in the hypopharynx. These diverticula are developed in the posterior wall, between the pars obliqua and the pars fundiformis where the musculature is weak. Since the area under consideration is a favorite place both for traumatic lesions and for cancer, unusually pronounced or extensive bulgings in it should always be regarded with suspicion and checked by esophagoscopy. The author emphasizes that he desires to show that a bulging of the posterior wall on the border between the hypopharynx and the esophagus can often be seen that this bulging corresponds to the so called esophagus lip demonstrated by Kilian, and also that this bulging is caused mainly by the lower part of the cricopharyngeal muscle the pars fundiformis which acts as a sphincter muscle in the esophagus mouth.

ADOLPH HAARUNG, M.D.

McGibbon J E G and Mather J H Simple Non Sphincteric Spasm of the Esophagus
Lancet 1937 232 1385

Simple non sphincteric spasm of the esophagus is described as spasm of that portion of the esophagus between the upper and lower sphincter muscles which is not due to an intrinsic organic lesion. However spasm of this portion of the esophagus may be the sole radiographic abnormality observed in such varying conditions as intra-esophageal injury, impaction of non opaque foreign bodies, esophagitis, central and peripheral nerve lesions, or early esophageal malignancy. Therefore these pathological conditions must be eliminated before the diagnosis of simple spasm as contrasted to spasm is permitted. Simple spasm is a neurogenic manifestation and appears to be secondary to disease or an altered

state of other organs and if it does not resolve spontaneously, satisfactory relief can be obtained only by treating the primary lesion. All types of esophageal spasm are transient as a rule less often intermittent and very rarely persistent.

The illustration shows the radiological appearance of five different types of simple spasm.

G. DANIEL DELPRAT, M.D.

Creys M and Ringenbach G Three Cases of Primary Malignant Tumor of the Mediastinum
(A propos de trois cas de cancer primitif du mediastin) *J de med de Bordeaux*, 1937 174 597

Although malignant tumors of the mediastinum have been studied for many years, our knowledge of them is still incomplete. The question of their origin is far from solved. Two types have been distinguished, the mediastinopulmonary lymphosarcoma with pulmonary or pleuropulmonary symptoms predominating and the neoplasms of the mediastinal glands.

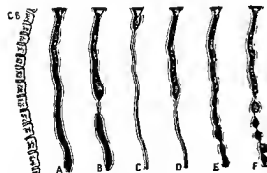
The authors report three cases. In the first case the initial symptoms were thoracic pain, cough and partial dullness and respiratory silence in the area where the radiogram showed a round opaque mass close to the heart. Seven roentgen ray treatments produced no improvement. Signs of venous compression appeared then pleurisy on the right side and then fever and the patient died about eight months after the appearance of the first definite symptoms.

In the second case the clinical syndrome was more complete and of the mediastinopulmonary type: dysphagia, hoarse voice, dullness and respiratory silence over the left lung which was opaque in the radiogram, loss of weight and asthenia were noted. The patient died about a year after symptoms were first noted.

In the third case the clinical symptoms were less definite: loss of weight, fever, cough, thoracic pain, and a mediastinal mass diagnosed by dullness, respiratory silence and the radiographic findings were noted. In this case the patient showed marked improvement under radiotherapy, and is still under observation and treatment.

In the first case the histological diagnosis of the tumor was made from a biopsy specimen obtained by puncture. In the second case at autopsy. In both cases the diagnosis was lymphosarcoma. In the second case it was of a very malignant type with a considerable number of polymorphoblasts. In the third case a biopsy specimen was obtained from an enlarged subclavicular gland, the tumor proved to be a reticulo endothelioma.

The symptomatology of mediastinal tumor is varied because in their development they press upon so many different structures. Compression of the lungs and the bronchi results in dyspnea and the cough of varying types. Compression of the superior vena cava produces edema and cyanosis of the face, neck, shoulders, upper extremities and thorax; collateral venous circulation in the thorax



A Normal esophagus B Localized spasm C Total tetanic spasm D Partial tetanic spasm E Diffuse irregular spasm F Functional diverticula

and, finally, signs of congestion of the cerebral veins, such as insomnia, tinnitus, vertigo, and epistaxis. Involvement of the pulmonary veins is responsible for passive pulmonary congestion, hydrothorax, and hemoptysis. If the inferior vena cava is involved, which is less commonly the case, there are ascites, enlargement of the liver, and edema of the lower extremities. Also, the growth of the tumor may cause dysphagia, displacement of the heart with tachycardia and hypertension, pushing-up of the aorta so that its beating becomes perceptible, and compression of the left brachiocephalic arterial trunk. Less frequently there may be a chylous pleurisy, which is due to the opening of the thoracic duct into the pleura, and various syndromes from compression of the recurrent, pneumogastric, and phrenic nerves. In the terminal period, especially, such general symptoms as loss of weight, asthenia, dyspepsia, and diarrhea, and particularly fever, are observed.

In order to determine the exact nature of the tumor, three methods of examination are used: laryngoscopy to determine any signs of recurrent-nerve involvement, radiography, often aided by the use of opaque substances, bismuth for the gastrointestinal tract and lipiodol in the bronchi, and histological examination of a biopsy specimen from a satellite gland, or from the tumor itself.

ALICE M. MEYERS

Norris, E. H.: A Thymoma (Adenoma of the Thymus) from an Unusual Case of Myasthenia Gravis, with Observations on the General Pathology. *Am. J. Cancer*, 1937, 30: 303.

The author alludes to his previous publication in which he reviewed the literature and found only eighty cases of myasthenia gravis which had come to autopsy. Of this group thirty-five presented a lesion of the thymus, which constituted a prominent anatomical feature. At that time he also reported four cases of myasthenia gravis, in two of which gross thymic lesions were found. The present report concerns another case of myasthenia gravis associated with thymoma, and a brief summary of a case reported by Loewenthal. The case was that of a male farmer, fifty-two years of age, who complained first of headache and ptosis of the left eyelid. He was observed over a period of about three and a half years, during which time he developed various complaints, such as weakness in abducting the right arm and shoulder, numbness on lateral side of the right little and ring fingers, weakness of the lower extremities, choking and coughing spells, sacro-iliac pain, and paroxysmal dyspnea and orthopnea. Autopsy revealed a flat ovoid tumor which weighed 63 gms., measured 9 by 6 by $3\frac{1}{2}$ cm., and occupied the anterior portion of the superior mediastinum. The cut surface showed a grayish, fleshy tissue containing numerous cysts of varied sizes.

According to the author, the diagnosis of myasthenia gravis in this case was based upon the characteristic lymphorrhages in the muscles and the thy-

moma. The author emphasizes the diagnostic importance of muscle biopsy in all doubtful cases in which this disease entity might possibly be considered. He states that it is extremely difficult to differentiate between a benign thymoma and an enlarged hyperplastic thymus. Analysis of the morphological evidence reveals that the differences between these two conditions are only those of varying degrees of epithelial hyperplasia. The author expresses the view that the thymoma of myasthenia gravis is best regarded as an adenoma of the thymus produced by an extreme degree of local hyperplasia of the thymic epithelium. The author agrees with Loewenthal that the cysts of the tumor have their origin in Hassall's corpuscles.

ALTON OCHSNER, M.D.

MISCELLANEOUS

Marks, J. H.: Diaphragmatic Hernia and Associated Conditions. *Am. J. Roentgenol.*, 1937, 37: 613.

The author reviews the anatomy of the diaphragm which is composed of three main parts, all of which insert into the central tendon. There is no sharp line of demarcation between the normal and the abnormal as regards the fusion or failure of fusion of these segments of the muscular portion of the diaphragm. Failure of fusion of the pars costalis with the pars lumbalis results in a persistent hiatus pleuropertonealis, or foramen of Bochdalek, which is a common site of hernia in children.

The author classifies diaphragmatic hernia as follows:

1. Thoracic stomach. the entire stomach is above the diaphragm and the esophagus is very short.
2. Diaphragmatic hernia with short esophagus. part of the stomach is above the diaphragm and the esophagus ends at the seventh or eighth thoracic vertebra.
3. Hiatus hernia. the hernia is through the esophageal hiatus and the esophagus is of normal length.
4. Congenital hernia. the hernia is most commonly through the foramen of Bochdalek or Morgagni; the large and small bowels are usually included, and other organs are frequently included.
5. Traumatic hernia.
6. Eventration of the diaphragm.
7. Congenital absence of the diaphragm.

The term thoracic stomach was given by Bailey to a case described by him in 1919. In the cases of true thoracic stomach all or nearly all of the stomach is above the diaphragm, being fixed there by reason of the extreme shortness of the esophagus. The author reviews several case reports.

The term "diaphragmatic hernia with short esophagus" is not strictly correct because the condition is not one of herniation of a once normally placed organ. The esophagus is definitely shorter than normal, although the shortening is not so marked as in the previous group.

In the patient having a diaphragmatic hernia with a short esophagus the esophagus passes downward through the posterior mediastinum in an almost straight line and enters the displaced stomach in its uppermost part. The upper end of the stomach is narrowed and frequently has the appearance of a dilated portion of the esophagus.

If the esophagus is short the stomach must of necessity remain at least in part within the chest at all times. Therefore, in cases of this type the displacement of the stomach should be visualized even when the patient stands erect. The author reviews the literature on diaphragmatic hernia with a short esophagus and reports two personal cases: one in a woman aged forty four and the other in a man aged sixty three.

The third type of diaphragmatic hernia is the hiatus hernia which is the most common type of diaphragmatic hernia. It is usually found in women over forty years of age who are overweight. In the group of seventeen cases in this series all but two were in women; the youngest of whom was thirty eight years of age. The average age of the group was fifty one years. Hiatus hernias are true hernias in the sense that the stomach was once in its normal position below the diaphragm. The esophagus is of normal length; its point of entrance into the stomach may be above the diaphragm, but careful examination will show that this is due to tortuosity and not to actual shortening. These hernias vary greatly in size. In most cases of the hiatus type the hernia is not present when the patient is in the erect position. In the great majority of hiatus hernias the displaced portion of the stomach remains for the most part to the left of the midline. The most common complaint in the author's series was distress after meals. This distress was usually described as a feeling of fullness in the upper abdomen, although at times the patient felt as if something were pressing against the heart. Only two patients gave a history of gross hemorrhage.

It is in the group of congenital hernias that we find the greatest departure from the normal, as well as variation in the organs involved and variation in the site of herniation. They are most commonly found in infants and children. Their symptomatology is often related more closely to the respiratory system than to the alimentary tract. The great majority of congenital hernias are found on the left side and occur through a persistent hiatus pleuro-peritonealis or foramen of Bochdalek. Less commonly the hernia occurs through the parasternal foramen of Morgagni. Occasionally it may occur through defects in other parts of the dome of the diaphragm. Of the six cases of congenital hernia seen by the author four were similar regarding the hernial opening and the organs displaced. In each of these all of the small bowel, the proximal two thirds of the large bowel, the spleen, and the omentum were in the left chest.

The fifth case was apparently similar except that the stomach was also in the left chest. The pa-

tients seen in this group were of the following ages: six weeks, three months, four years, nine years, ten years, and thirteen years. In all except the two halves the outstanding symptoms were recurring attacks of partial intestinal obstruction.

Traumatic hernias may occur in children or adults and are always false. Hedblom found that approximately 90 per cent occurred in males and that about 50 per cent were due to penetrating injuries. Of those due to non penetrating injuries only 23 per cent were due to crushing and 36 per cent were due to falls. Traumatic hernia may occur through any part of the diaphragm, but 95 per cent are found on the left side.

Intestinal obstruction is a frequent complication of traumatic hernia due to the dense adhesions formed around the margins of the hernial orifice. One of the two cases of traumatic hernia described by the author was that of a man aged thirty nine the other that of a boy aged eleven.

Eventration of the diaphragm may be congenital or acquired and is the result of aplasia or atrophy of the muscle fibers of the diaphragm. Moore and Kirklin have stated that the respiratory movement may be normal, diminished, absent or reversed in either eventration or hernia. The diagnosis of eventration is of course dependent upon the demonstration of an elevated but intact diaphragm. The author reports a case in a man fifty nine years of age.

Congenital absence of the diaphragm is a rare condition; the author reviews the literature. In his opinion the diagnosis of congenital absence of the diaphragm should be carefully considered by the roentgenologist when studying cases of diaphragmatic hernia and associated condition especially those of congenital origin. This diagnosis should not be considered proved until the patient is subjected to an exploratory operation by a competent surgeon.

HAROLD C. OGDEN, M.D.

Von Greyerz W. On Hernia Diaphragmatica Retrosternalis. *Ida radiol.* 1937 18: 428

The author reports a post mortem finding of a retrosternal diaphragmatic hernia which had been diagnosed in 1910 with the roentgen rays but had not given any symptoms.

This type of hernia belongs to the hernias originating from distributional disturbances. Anatomical support for this statement is found in the existence of Morgagni's foramen or the sternocostal trigonum, with its increasing size after adolescence.

In contrast to diaphragmatic hernia in general retrosternal diaphragmatic hernia occurs predominantly on the right side; the ratio of the right to left being 13:3.

Nearly sixty cases of retrosternal diaphragmatic hernia were reported up to 1932; thirty of these were reported during the last eight years.

The contents of the hernias consisted in the majority of the cases of the colon or the omentum or both.

The mortality was 10 per cent, death occurred in six of the sixty cases. It was caused by strangulation.

Seven cases, including that reported by the author, were diagnosed clinically with the roentgen rays.

Oehlecker, F.: A Contribution to the Question of Hiatus Hernia (Beitrag zur Frage der Hiatus hernien) *Deutsche Ztschr. f. Chir.*, 1936, 248 153

The author reports two cases, the first, that of a thirty-six-year old woman with a non-incarcerated hernia, and the second, that of a fifty-nine-year old woman with a hernia incarcerated for several days. Both were treated by laparotomy because of the severe clinical symptoms. In both the surgeon's finger could pass through the hiatus clear up to the posterior surface of the heart. The ring of the hernia was closed. Immediately after the operation the symptoms which lasted for years disappeared. They had consisted of the retention of food at the esophageal entrance of the stomach, which had often caused retching and vomiting, until after many hours the food came up. The symptoms were worse in the horizontal position, with pain in the region of the heart. The roentgenogram showed normal conditions in the first case five months after operation, and in the second case, a year and a half after the operation.

Oehlecker discusses the frequency of the condition in detail. He does not agree with Knothe regarding the frequency, and offers Sauerbruch's explanation that we often misunderstand the mobility of the esophagus in performing the digestive act, and that a diverticulum of the esophagus above the diaphragm may be unrecognized. He describes

the anatomical conditions and illustrates the same, and refers to Carrey's lumen on the sternum, the spatium sterno-costale, and Bochdaleck's lumen on the costolumbal trigonum. In the latter position most of the hernias are found. It is incorrect to deny that a hiatus hernia is present if it is only visible in the roentgenogram in the horizontal position, because even small inguinal hernias often appear only when the patient coughs or strains in the standing position. Certainly many of these hernias are without importance. A general method of differentiation of hiatus hernia from diverticulum of the esophagus is not known at the present time. Berg said that mucous-membrane folds, visible in the roentgen film, above and below the diaphragm, are a sure sign of a hiatus hernia, but this is denied by other observers. In both of his cases the author noticed these folds radiating through the diaphragm to the groin so that there could be no doubt in the diagnosis. Not the roentgenogram, but the clinical observations and symptomatology should give the indications for an operation, because even large hernias of the stomach above the diaphragm may be free from symptoms. But, in cases of patients over thirty, in whom there has been no trauma, and in whom characteristic cardiac and gastric symptoms are present, a hiatus hernia should be suspected. The operation should be done only when the symptoms are severe, with an incision over the left border of the ribs and upward displacement of the flap. When the hernia has been caused by trauma, the incision should be made through the pleura, according to Sauerbruch.

(FRANZ) WILLIAM C. BECK, M D

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Divella D A Contribution to the Knowledge of the Cause of Death in Experimental Bile Peritonitis (Contributo alla conoscenza della causa mortis nel coleperitoneo sperimentale) *Arch ital di chir* 1937 16 249

In order to study the question whether death in bile peritonitis is due to a true chemical irritation or to a toxic infective bacterial action Divella undertook a series of experiments on dogs. The hepatic and renal functions were studied. The animals with bile peritonitis were sacrificed in the preagonal stage and histological examinations were made in all cases.

In the first series of experiments the object of which was to study the functional and histological changes following wounds of the apparently normal gall bladder and the types of bacteria in the peritoneal exudate the fundus of the organ was cut off. The results demonstrated that the flow of bile into the peritoneal cavity causes in addition to serous peritonitis severe toxic lesions in the liver, spleen and kidneys. The hepatic and renal functions are gravely damaged within twenty-four hours. In one case before operation the bile was positive for colon bacilli and streptococci; in the others it was sterile. The peritoneal exudate in all cases contained these organisms.

The purpose of the second series was to demonstrate the cause of death. Sterile autoclaved or bile was injected into the peritoneal cavity through an aseptically made abdominal incision. The liver and kidneys showed marked hemorrhages and edema with some parenchymatous degeneration. These experiments showed that even in the absence of advanced degenerative lesions the hepatic and renal functions may be sufficiently affected to cause death by rapid and violent intoxication. The peritoneal exudate contained the colon bacillus in all cases and in one case each staphylococci, streptococci and micrococcus tetragenus. The sequence of events is probably a peritoneal reaction due to the bile followed by a serofibrinous peritonitis and an arrest of peristalsis with migration of bacteria increased in virulence through the intestinal wall.

In the control series filtrates of broth cultures of the colon bacillus and streptococcus were injected into the peritoneal cavity and twenty-four hours later attenuated cultures of the same organisms. The purpose of these experiments was to determine whether the bacteriotoxic factor in bile peritonitis is as important as is affirmed by some authors. The animals remained well; the hepatic and renal functions were unaffected and at autopsy cultures from the peritoneal cavity were negative. From these results Divella deduces that the functional disturbances and the local and general lesions are due essen-

tially to the toxic action of the bile. The interval between operation and death in these experiments was so short—twenty-four hours, that death could not be attributed to the complex mechanism of infection. The bacteria are either indifferent or their toxic action is secondary and slight. The rapid death is due to functional hepatic and renal insufficiency caused by the violent intoxication rather than to organic lesions. M. E. Morse M.D.

Wegener R Experiences with Surface Anesthesia of the Peritoneum in Laparotomies (Erfahrungen mit der Oberflächenanästhesie des Peritoneums bei Bauchoperationen) *München med Wchnschr* 1937 1 342

In 125 major abdominal operations on the stomach and intestines, biliary passages and in adhesions, anesthesia of the peritoneum was produced in the following manner:

After anesthesia of the abdominal wall in two layers with 100 c.c.m. of 0.5 per cent novocain solution introduced into the parietal fold of the peritoneum, a small incision was made and through a closely fitted tube 300 c.c.m. of a 1:5 to 1:1000 solution of pantocain (0.45, 300.0 plus 2.7 gm. of sodium chloride) were allowed to flow into the peritoneal cavity after slight elevation of the pelvis. After from eight to ten minutes the anesthesia was sufficient to permit complete opening of the peritoneum and the operation was continued. The anesthesia lasted from two to two and one-half hours.

In almost 58 per cent of the cases no additional anesthesia was necessary, but in the rest usually only a slight additional anesthesia with evipan or ether was required. Pull on the peritoneum and ligation of the blood vessels were painful. Interventions on the biliary system were sometimes not entirely in sensible operations on the stomach took the best course. A further limitation of additional anesthesia seems to be available with the use of twilight sleep with scopolamin, eukodaf, ephedrin according to the method of Karschner. After-effects were not observed and pulmonary complications are much less common than after other anesthetic procedures. (DRLEGG) LOUIS NEUWELT M.D.

GASTRO INTESTINAL TRACT

Savarese E True Muscular Pyloric Hypertrophy of the Adult (L'ipertrofia pilorica muscolare pura dell'adulto) *Arch ital di chir* 1937 45 559

Savarese defines muscular pyloric hypertrophy as a special alteration of the pylorus characterized by a thickening of this portion of the stomach due to hypertrophy of the muscular tunic and without participation of the other layers. According to this definition the condition is sharply distinguished from all the other forms of pyloric hypertrophy which are

based on different anatomical substrates such as simple inflammatory, luetic, tuberculous, and neoplastic conditions

Concerning the incidence of this disease, it may be considered as being very rare. Predisposing factors are (1) age, the disease is usually encountered in individuals past forty years of age, (2) sex, females are slightly more susceptible than males; (3) race, the disease occurs chiefly in the Latin races and not in Anglo-Saxon races, as some authors have pointed out, and (4) heredity.

With reference to the pathogenesis of this condition, several theories have been advanced, the most important ones being (1) the congenital theory, (2) the inflammatory theory, (3) the neoplastic theory, (4) the theory of hypertrophying spasm, and (5) the mixed theory.

Anatomicopathologically, the microscopic sections reveal an annular or cylindrical intumescence of the pylorus. The thickening may be extensive and may involve the entire pyloroduodenal tract, and from 2 to 7 cm. of its diameter may be increased from 3 to 5 cm. In less severe lesions the pylorus does not show any external evidence of an anatomical change. On palpation the tumor appears to have a smooth surface, its consistency is hard and fibrous, and it is movable to the normal range of mobility of the pylorus.

On sectioning the pyloric wall appears greatly thickened and the thickening involves chiefly the muscular layer of the wall. The histological picture confirms essentially the gross findings. Careful microscopic studies show that the inner circular layer of the tunica muscularis is involved especially. The muscle cells are found to be normal as to their arrangement, form, and size. The connective tissue stroma as well as the subserosa and serosa are always found to be normal. Sometimes there is found in the mucosa a leucocytic infiltration which extends also into the muscularis mucosae and sometimes also into the submucosa.

The clinical picture is essentially that of a pyloric stenosis. In some cases the onset is very insidious and the patient complains of dyspepsia, which ultimately leads up to the symptomatology of a pyloric stenosis.

Diagnosis may be difficult. In the majority of the observed cases, the diagnosis was made either during the operation or during postmortem examination. Roentgenograms may, to a certain extent, be of some value to the diagnostician.

The condition must be differentiated from (1) pylorospasm, (2) peripyloritis, (3) simple pyloric ulcer, (4) annular carcinoma of the pylorus, (5) hypertrophic tuberculosis of the pylorus, and (6) sclerogummatous syphilis of the pylorus.

The prognosis is essentially the same as in pyloric stenosis. Treatment should be always surgical and aim to remove the obstruction.

The author reports two cases which came under his personal observation. In one case the observed lesion was a true hypertrophy, but in the other case

the condition was associated with inflammatory changes.

From the study of these cases the author concludes that the histological findings do not permit a differentiation between a true pyloric hypertrophy and a pyloric hypertrophy associated with inflammatory changes. According to his opinion the distinction depends entirely upon causal and evolutive differences of a process which is essentially the same in every case.

RICHARD E. SOMMA, M.D.

King, E. S. J.: Some Reflections on Gastrostomy. *Brit J Surg*, 1937, 24, 749.

In the majority of patients, gastrostomy is performed merely as a palliative procedure to maintain the nutrition of the patient with carcinoma of the esophagus. Gastrostomy becomes a very important procedure when the treatment of carcinoma of the esophagus is attempted by radical means. The operation of gastrostomy is one which requires special knowledge, care, and study. This is true on account of the innumerable problems to be faced after the immediate operative result has been attained. No gastrostomy can be regarded as justifiable unless the patient receives adequate and satisfying nourishment without discomfort and distress. The indications for the operation are bound up with these requirements. The particular operative method is of relatively little moment in ideal circumstances. That which utilizes a gastric flap is generally more advantageous. The diet must be carefully and thoroughly controlled, and is best given in the form of solid food.

A case of gastrostomy therefore demands minute attention, greater than that required in most major operations. It is only under these conditions that the patient will gain that amount of comfort and improvement in his physical and mental condition which justifies the operation as a palliative measure, and that the greatest chance of withstanding any additional operative procedure will be ensured.

JOHN W. NUTZ, M.D.

Marshall, S. F., and Taylor, E. S.: Carcinoma of the Stomach. An Analysis of 291 Cases. *Surg Clin North Am*, 1937, 17, 629.

Carcinoma of the stomach is a common disease and constitutes a high percentage of the gastric cases coming to surgery. Over a period of ten years in the Lahey Clinic three patients out of every eight requiring surgical management for relief of gastric symptoms had cancer of the stomach. Forty-one per cent of the patients did not come to surgery.

An analysis of the common symptoms revealed the typical syndrome of the advanced condition to be marked loss of weight, anorexia, epigastric distress often with vomiting, pallor, and tarry stools, and often with a palpable mass in the epigastrium. In the presence of these symptoms and findings little or no surgical assistance can be offered. Gastric analysis and gastro-intestinal x-ray studies offer the greatest possible assistance. Symptoms of vague indiges-

tion particularly when there is anorexia and loss of weight should always demand a complete gastroenterological study. The greatest incidence of cancer of the stomach in males occurs after the age of forty years. The condition may also appear in the young individual.

Today surgery offers the only treatment for cancer of the stomach of any value. In a series of 201 patients with gastric carcinoma a radical operation was considered possible in only 16 or 6.1 per cent. Even when the growth is relatively large exploratory operation should not be passed over too lightly because the lesion may be suitable for removal and the patient's comfort and life thereby prolonged. This cannot be decided definitely in many patients until the abdomen is explored.

The results of these operations are frequently disappointing because many of the cases are far advanced. There can be no question that some of the patients are cured by operation. The author has had an operative mortality of 33 per cent. It is only from earlier diagnosis that better surgical results can be expected. JOHN W. NELSON, M.D.

ORR, T. G. The Therapeutic Management of Intestinal Obstruction. *Surgery* 1937, 1, 838.

There is no substitute for early operation when the intestine is mechanically obstructed. The factors in the treatment of obstructive lesions of the intestine are presented as follows:

Relief of the mechanical obstruction by operation is foremost. The time and method of the operative procedure depends on the type of obstruction and the condition of the patient. Preliminary treatment should not be prolonged. The administration of water, sodium chloride and dextrose, and gastric suction should be done promptly. Simple occlusion of the intestine can be relieved by direct attack. Stripping of the bowel is harmful. When strangulation of the gut is relieved the bowel may be left intact if viable. Frequently it is safer to exteriorize a necrotic segment than to resect it and remove it after closing the abdominal wall and leave the open ends to be closed later by anastomosis or the Mickulicz technique. Resection of a distended intestine is dangerous. Enterostomy is an operation of necessity and not of choice. The Witzel method with a No. 16 or 18 French rubber catheter is recommended. When bloody fluid is found in the abdominal cavity it is necessary to rule out strangulation of the gut before enterostomy is done. The logical place for intestinal drainage is just proximal to the point of obstruction. Enterostomy is not free from danger. It will not drain a paralyzed bowel. The gastric suction method is far more valuable in paralytic ileus.

The restoration and maintenance of the water balance, the chemical balance, and the nutrition is imperative. From clinical experiments Maddock and Collier have estimated that a dehydrated patient needs an initial restoration of fluids equivalent to 6 per cent of the body weight. The body needs 3,500 c.c.m. of water daily. If much of the gastric and

upper intestinal secretion has been lost by vomiting and suction several liters more of fluids are needed. The total daily secretion into the upper intestinal tract is equivalent to from 7 to 9 liters. After the initial water deficit is made up the patient needs the daily quota until he is able to retain food and liquid by mouth.

The marked chemical changes which occur in intestinal obstruction are a loss of chlorides, an increase in the carbon dioxide combining power, and an increase in non-protein nitrogen. The plasma volume and the plasma protein may be decreased in very ill patients. By restoration of the chloride balance the acid base imbalance is corrected and destruction of body protein is minimized. Since there is some danger of giving too much water and sodium chloride which predispose to general and pulmonary edema especially when protein depletion is imminent the transfusion of blood is indicated. To control the salt intake the blood chloride should be estimated every second day.

Dextrose may be given freely to furnish a part of the needed nutrition. Water, sodium chloride and dextrose should be injected into the veins up to 2,000 c.c.m. per day at the rate of 60 drops per minute and the remaining 1,500 c.c.m. daily requirement of water should be given under the skin. It is doubtful if proctoclysis is sufficiently dependable to annoy the patient with it.

The prevention and relief of bowel distention is essential for logical treatment. A patient with distention of the stomach or intestine is dangerously ill because of the interference with the blood supply of the wall. It is believed that there is no absorption of toxic products from the lumen of an obstructed intestine until over distention has damaged the circulation of the gut wall. To relieve this distention continuous suction drainage with an indwelling nasal Levine tube is indicated. The patient then may drink water freely and add to his comfort. The indwelling tube may be used to test the recovery of the bowel function. Enemas are of doubtful value and the expelling of flatus and feces therewith give rise to a feeling of false security.

By the prevention and reduction of distention of the gut muscle tone and rhythmic contractions are maintained. Since morphine tranquilizes the tone and rhythmic contractions of the small intestine it may be given with assurance in sufficient quantity to make the patient comfortable. Sodium chloride helps maintain the bowel tone if kept within physiological limits. Spinal anesthesia should not be relied upon to evacuate the bowel as long as it is obstructed. Pituitary extract and similar peristaltic stimulants should not be used while the obstruction exists. It is the opinion of Ochsner that these stimulants are of little or no value in the treatment of ileus.

The application of heat to the abdomen by moist or dry methods is beneficial. No known harm comes from it and clinical observation commends its effect.

Oxygen therapy is perhaps too little used. The recent work of Fine and his associates shows the

absorption rate of gas within the bowel is increased in direct proportion to the quantity of oxygen given. The administration of oxygen should not be postponed until the patient is cyanotic or moribund. Oxygen may be administered by any method.

Bed posture is often overlooked. The comfort and vital capacity of the patient are increased by raising his back rest to a semi-sitting position.

In conclusion, when early diagnosis and operation have relieved the intestinal obstruction many of the factors in the treatment may fail. It should be emphasized that extensive operations are hazardous and the briefest operative procedure with the least possible trauma constitutes the proper therapeutic management.

JOHN E. KIRKPATRICK, M.D.

Clark, E., and Wright, A.: Acute Phlegmonous Enteritis. *Arch. Surg.*, 1937, 34, 997.

Two additional cases of acute phlegmonous enteritis are added to the two American and thirty-nine foreign cases found in the literature.

A forty-five-year-old white man, from whom a coherent history was not obtainable, died forty-eight hours after admission to the hospital with the clinical picture of mental confusion and disorientation, abdominal distention, spasticity and tenderness of the right lower abdominal quadrant, leucocytosis, and shock. Necropsy revealed acute diffuse fibrinopurulent inflammation of about 30 cm. of the ileum, affecting chiefly the submucosal coat and extending to the serosa and into the mesentery. The mucus membrane was not ulcerated. There was terminal thrombosis of some of the branches of the mesenteric vessels in the involved intestine and mesentery.

The second case was that of a forty-six-year-old man, with a history of chronic alcoholism, who became acutely ill with cramplike abdominal pain, vomiting and diarrhea, chills, fever, and leucocytosis. Abdominal examination revealed tenderness and inconstant rigidity of the left side of the abdomen, accompanied by an ill-defined mass in the left upper quadrant and to the left of the umbilicus. Death occurred six days after the onset of the symptoms. Autopsy revealed an acute diffuse fibrinopurulent inflammation of 20 cm. of the jejunum, affecting chiefly the submucosal coat, without mucosal ulceration, and extending to the serosa and into the mesentery. A localized fibrinopurulent peritonitis accompanied this extension.

The pathological and clinical characteristics in forty-one similar cases, reports of which were gathered from the literature, are reviewed. It appears that acute phlegmonous enteritis is a well defined clinical and pathological entity, and although it is most likely an infection of the wall of the intestine from pyogenic micro-organisms of enterogenous origin, a portal of entry is only very rarely demonstrated.

The possible relationship of the acute phlegmonous lesion of the intestine to chronic non-specific lesions of the intestine is discussed.

RICHARD J. BENNETT, JR., M.D.

Hipsley, P. L.: Symposium on Intestinal Obstruction: The Treatment of Intussusception. *Surgery*, 1937, 1, 825.

The purpose of this article is to present evidence in favor of the treatment of intussusception of the colic or ileocolic type by a preliminary injection per rectum, before resorting to operation. In the author's series of 142 consecutive cases, he found that about 60 per cent were completely reduced by hydrostatic pressure, and that by carefully observing certain signs it was possible to be certain of complete reduction in 40 per cent of all cases coming under treatment.

Normal saline solution is used for the injection. The pressure of the column of saline solution used should not exceed 3 ft. 6 in. in height. The procedure is carried out under general anesthesia in a room adjoining the operating room. The container is hung at the proper level above the table on which the infant is asleep. A No. 15 soft rubber catheter is inserted a few inches into the rectum, without lubrication, and the buttocks are compressed together to prevent the saline from escaping. The outline of the distended colon is followed, but no pressure from manipulation is used for fear of rupture of an ulcerated area. After three minutes the catheter is allowed to drain. The first return usually clears out blood, mucus, and some feces. The process is repeated twice. A thin barium solution may be used the last time to demonstrate the presence of opaque fluid in the small bowel, which denotes complete reduction.

Other signs of complete reduction of the intussusception are of value, but the only trustworthy sign is abdominal distention which remains after the saline solution has been allowed to escape from the colon. This prolonged distention is obviously due to distention of the small bowel by fluid. When the intussusception is new the abdomen is usually soft and flaccid and a mass can be palpated. When the reduction is successful the distention of the small bowel occurs and the circumference of the abdomen at the umbilicus will show an increase of about two inches. Occasionally helpful signs of reduction are the return of yellow feces after a second or third injection, the presence of flatus after the first injection provided air has not been injected with the enema, and the presence of orally administered charcoal in bowel washings within five hours.

A small grid-iron incision was made in about 20 per cent of the cases to verify reduction with a mortality of 3.3 per cent. In about 40 per cent of the cases no operation was necessary after injection and no deaths occurred. In about another 40 per cent of the cases operation was performed because of the inability to effect a reduction by injection, the mortality was 11.5 per cent.

A number of cases are briefly described. In five of the seven patients who died the duration of the intussusception was three days and over; in one, two days, and in another, five hours. The latter patient died from infection which was a direct result of the

operation. In three cases resection was done. In two cases toxemia and shock caused death. One child died as the result of perforation of the bowel in the area of a ring ulcer of the ileum at the apex of the intussusception. In this case manual palpation during the injection was believed to be the cause of the perforation. At operation the leaking perforation was found and although the injection reduced the intussusception the patient died twelve hours after operation.

In view of a certain mortality rate attending laparotomy in infants and the recovery, of 40 per cent of the patients with colic or ileocolic intussusceptions from the use of hydrostatic pressure the author recommends this method as a preliminary treatment before resorting to operation. The most important factor in reducing the mortality rate is early diagnosis and effective treatment.

JOHN E. KIRKPATRICK, M.D.

Adams H. D. Regional Ileitis. *Surg. Clin. North Am.* 1937, 17, 793.

Regional ileitis is a chronic inflammatory disease of the small bowel usually involving the terminal ileum and of great surgical importance primarily because of the complications which arise in its later stages, namely obstruction and perforation. Its cause is unknown.

The disease process is usually limited to the small intestine and more especially to the terminal ileum. It rarely involves the jejunum but the cecum and ascending colon are frequently involved. It is believed that the infectious agent attacks the submucosa first and produces ulceration of the mucosa secondarily. The gross appearance of the bowel is quite similar to that seen in chronic ulcerative colitis. The bowel wall is markedly thickened, rigid and fibrotic. The fibrosing process reduces both the circumference and the lumen of the bowel. Obstruction and chronic perforation are the dangerous sequelae.

There were fifteen cases of regional ileitis which came to operation. The disease is commonly one of early adult life. The youngest patient was sixteen years and the oldest sixty-nine years of age. The average duration of the symptoms was two years. The common typical symptoms were abdominal pains, diarrhea or constipation, vomiting, general debility and loss of weight. Only two patients came to early operation; the remaining thirteen were in the late chronic stages. Resection was done in nine patients and all were benefited and are symptom free from one month to four years postoperatively. In three patients an ileocolostomy only was performed two are well six months and three years respectively thereafter and the third died from extensive infection involving the abdominal wall and multiple fecal fistulas.

These results appear to indicate that complete eradication of this disease by resection is the treatment of choice in the majority of cases. A two stage operation is generally believed to be safer for the patient and was performed in twice as many cases as

the one stage procedure. There were two deaths in this series, a mortality of 13.3 per cent.

JOHN W. NICHOL, M.D.

Wells A. O. Experimental Lesions of the Rabbit's Appendix. *Brit. J. Surg.* 1937, 24, 166.

The experiments described were performed in an attempt to determine the cause of acute appendicitis. Although appendicitis is essentially a bacterial infection, there is still a lack of knowledge as to the special conditions which lead to its occurrence. Many investigators oppose the theory of a specific infection and stress the theory of mechanical stagnation of the appendicular contents and consequent infection with bacteria normally present in the appendix.

The writer employed young rabbits weighing between 500 and 900 gms. for his experiments. The injection of bacteria, either intravenously or directly into the appendix lumen, in no case caused appendicitis. The bacteria used were in most of the cases isolated from human appendices. Ligation of the appendicular blood vessels together with the meso-appendix resulted in gangrenous appendicitis and death of the animals. Obstruction of the lumen of the appendix in the rabbit did not cause appendicitis. Such a procedure often resulted in a mucocoele of the appendix. Obstruction of the lumen of the appendix when the mucous membrane was damaged was always followed by acute inflammation of the appendix and death of the animal. It was immaterial whether the obstruction was caused by a ligature or by a foreign body. JOHN W. NICHOL, M.D.

Wilkie Sir D. Simple Ulcer of the Ascending Colon and Its Complications. *Surg.* 1937, 1, 635.

As man is primarily herbivorous with a large proximal colon but has become facultatively carnivorous, Wilkie believes that the proximal colon is in an awkward state of equilibrium which renders it susceptible to disturbances. The author draws an analogy between the proximal colon with its connections and the stomach, suggesting that the ileum corresponds to the esophagus, the cecum to the cardia, the cecocolic colon to the body, and the cecocolic tract (Kent's) to the pyloric antrum and pylorus. If this analogy is followed to its conclusions, the medial wall above and beyond the ileocecal valve should be the most frequent site of ulcer in the ascending colon as ulcers are found most frequently on the lesser curvature of the stomach.

Four cases of simple ulcer of the descending colon are reported from a surgical practice of twenty years but this finding was not believed to be a true index of the frequency of the lesion. All four patients were past forty-five years of age, had a history of chronic constipation and some right lower quadrant abdominal pain; three were females. One passed about one ounce of red blood from the rectum. Two of the patients had a perforation of the colon; one perforation caused a gas-filled retroperitoneal abscess and the other a diffuse peritonitis both were fatal. One patient showed a healed ulcer with a fibrous band

partially obstructing the colon, and in one patient the acute stage so resembled carcinoma grossly at operation that a resection of the cecum and ascending colon was done.

The relative inexpandibility of this portion of the colon was the only pertinent causative factor mentioned. The symptomatology is so vague that one of the complications usually occurs before a diagnosis can be made. Hemorrhage, subacute perforation with the occurrence of peritonitis, acute perforation, formation of a pseudoneoplasm, and stenosis from cicatricial contraction were reported as complications.

The author recommends resection for those cases resembling a neoplasm, with an alternative simple ileocolostomy when the general condition of the patient does not warrant the more radical procedure. Closure of the perforation with drainage is recommended for this complication. The author suggests that in cases of perforative peritonitis the ascending colon should be inspected after the common sites have been ruled out and that in gas gangrene or cellulitis of the right flank, perforating ulcer of the proximal colon should be suspected.

THOMAS C. DOUGLASS, M.D.

Van Praag, A.: Sigmoiditis (Les sigmoidites). *Bruelles-méd.*, 1937, 17, 913.

The author defines sigmoiditis as a segmentary inflammation of the pelvic colon. It usually occurs in the middle-aged adult and is found only occasionally before the twentieth year of age. It has been very rarely observed in aged individuals. The greatest incidence is found in individuals between forty and fifty years of age. Males are more frequently affected than females, and obese individuals seem to be especially predisposed to this condition.

Sigmoiditis may be caused by the usual intestinal bacteria such as the colon bacillus, the streptococcus, the staphylococcus and the enterococcus. The pathogenic organisms penetrate through the mucosa or may reach that portion of the intestine following systemic infections, such as tuberculosis and syphilis. Dysenteric and actinomycotic forms of sigmoiditis have been described.

The specific forms of sigmoiditis include

- 1 Tuberculous sigmoiditis, which in turn may be subdivided into (a) an ulcerative form, (b) fibrocaseous enteroperitoneal form, and (c) hypertrophic, pseudoneoplastic, form. In the latter form the subserosa thickens and gives rise to a hard tumor surrounded by a sclerolipomatous tuberculoma.
- 2 Syphilitic sigmoiditis, which usually runs a clinically asymptomatic course.
- 3 Mycotic sigmoiditis, characterized by the presence of multiple abscesses.
- 4 Dysenteric sigmoiditis, usually of amebic origin.

The mechanical causes which are responsible for the outbreak of the condition are fecal impaction and diverticulitis. Intestinal diverticula which are usually found at the level of the sigmoid colon are the most common mechanical causes of sigmoiditis.

After having briefly reviewed the literature on the subject, Van Praag describes the anatomicopathological features of this condition. Diverticula have their sites of predilection along the insertion of the mesosigmoid at that point where the vessels perforate the intestinal tunics, at the site of origin of the epiploic appendages, at either side of the longitudinal muscle layer, and in the interstices between the muscle bundles.

These diverticula give the appearance of sessile and pedunculated small tumors of blackish color ranging from the size of a pin head to that of a cherry. They are never completely empty but contain food debris, as a rule. When inflamed, their orifices are masked by the presence of a congested and ulcerated mucous membrane and their cavity may contain pus. The adjoining epiploic appendages are hypertrophied and hemorrhagic areas are common.

Concerning their pathogenesis, mainly three theories have been advanced, (1) the congenital theory, (2) the glandular theory, and (3) the mechanical theory.

Of the non-specific forms of sigmoiditis, the author describes three forms: (1) the acute, non-suppurative forms, or rectosigmoiditis dolorosa; (2) acute suppurative forms, perforating or non-perforating; and (3) chronic sigmoiditis, which in turn may be subdivided into a simple form, a chronic form with pseudocancerous tumor formation, and a chronic stenosing form.

Röntgenological examination is undoubtedly of the greatest value. It may reveal the presence of diverticula, a stenosis, or the presence of adhesions. Endoscopic examination and biopsies will permit a differential diagnosis from carcinoma. Examination of the feces, finally, will be helpful in determining the degree of inflammation.

Medical treatment if instituted early and methodically will offer great improvement. Among the numerous surgical procedures, colostomy is the method of choice in most cases.

RICHARD E. SOMMA, M.D.

LIVER, GALL BLADDER, PANCREAS, AND SPLEEN

Lahey, F. H.: Strictures of the Common and Hepatic Ducts. *Ann Surg.*, 1937, 105, 765.

This article deals with thirty-five cases of stricture of the common or hepatic duct which were operated upon by nine different procedures. Practically all the strictures of the common and hepatic ducts result from clamping the duct during cholecystectomy. The most common mistake is the clamping of the hepatic or common duct in an endeavor to control bleeding from a torn cystic artery, as shown by Figure 1. A section of the common or hepatic duct may be removed by clamping the duct after it has been angulated by traction on the cystic duct.

The production of complete external biliary fistulas and the later transplantation of these

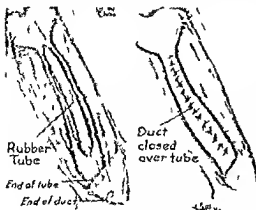


Courtesy of the J. B. Lippincott Co

Fig. 1. How a clamp which catches the bleeding end of the cystic or right hepatic artery can also catch the hepatic duct and cause stricture

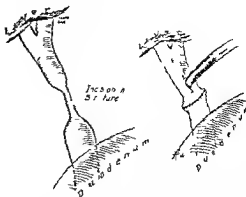
fistulas into the stomach or duodenum has proved an unsatisfactory operative procedure. This fact was demonstrated in fourteen cases. Direct anastomosis of the duct is much more desirable but in a certain percentage of the cases this procedure cannot be accomplished.

Lacey presents detailed reports of nine successfully treated cases, each of which was treated by a different method to illustrate his procedure in the management of this type of surgical condition.



Courtesy of the J. B. Lippincott Co

Fig. 2. Method of treating stricture of hepatic duct



Courtesy of the J. B. Lippincott Co

Fig. 3. Longitudinal incision of common-duct stricture and closure about T tube. Note position of upright limb of T tube in relation to line of closure of stricture

The first case represents a successful end to end anastomosis of the severed duct. The stumps of the hepatic duct and the common duct were joined together over a T tube. A feature which permitted a good result in this case was the lack of tension on the uterus after the ends of the duct were brought together.

The second case illustrates the Mikulicz principle for approximation of the ducts and this procedure was made possible only because there had been a fusion of the posterior wall of the ducts as a result of the inclusion of both ducts in the ligature at the first operation.

The third case presented a difficult problem because of an extremely long stricture. A rubber tube was introduced into the common duct and the duct was closed over the tube. This procedure was followed because there seemed nothing else to do and up to six and one half months the results have been very gratifying. (See Figure 2.)

In the fourth case there was a narrow stricture which allowed easy reconstruction of the duct over a T tube.

In the fifth case the dilated stump of the common hepatic duct was successfully anastomosed directly to the duodenum.

In the sixth case the strictured common duct was reconstructed over a T tube by a method similar to that used in the fourth case but different in that the upright limb of the T tube was brought through an unstrictured portion of the duct instead of through the suture line. (See Figure 3.)

In the seventh case a cholecystogastrostomy gave a successful result.

In the eighth case the patient was relieved of cicatricial obstruction of the common duct by excision of a constricting band.

The ninth case presented a very complicated problem. All the bile discharged through an external biliary fistula which had its origin in the

dilated, strictured common duct. Operative treatment consisted of implantation of the fistula into the stomach and anastomosis of the stump of the cystic duct directly with the duodenum.

EARL GARSIDE, M D

Wolfer, J. A : Pancreatic Juice as a Factor in the Etiology of Gall-Bladder Disease. *Surgery*, 1937, 1 928

Embryological and anatomical evidence indicates that it is possible, in the human, for a continuous pathway to exist between the pancreatic and biliary systems in a considerable percentage of cases. Since the secretory pressure of the pancreas is greater than that of the biliary system in the presence of obstruction at the papilla, it is possible for pancreatic secretions to mix with bile in the common duct. The obstruction may be complete, such as that produced by a stone impacted in the ampulla, or it may be incomplete or intermittent. Ivy has shown that biliary stasis without definite organic obstruction of the duct at its entrance into the duodenum is common. There are many clinical examples proving the fact that pancreatic juice may enter the gall bladder and that, associated with this phenomenon, necrosis of the gall bladder may exist with or without biliary peritonitis. A number of observers have called attention to cases of acute gangrenous cholecystitis in which cultures from the gall-bladder walls or contents were sterile, the process suggesting an acute digestion of the gall-bladder wall.

Recently, Colp, Gerher, and Doubilet reported three cases of acute cholecystitis, the gall-bladder bile in two contained both amylase and trypsin, and in one only amylase. In two cases the cultures were negative, and the third revealed both the Friedlaender and colon bacilli. In two cases free bile was present in the peritoneal cavity, and in one case fat necrosis was present throughout the gall-bladder wall and in the omentum adherent to the gall-bladder. Experimental evidence clearly indicates that the pancreatic juice may affect the walls of the gall bladder under variable conditions and produce different types of changes, varying from acute necrosis to chronic hyperplastic and inflammatory reactions. Assuming these observations to be true, the following hypothesis may be constructed.

Under normal conditions the bile passes through the ducts to be emptied into the duodenum, some entering the gall bladder to be concentrated and later to be expelled into the common duct. The pancreatic juice has a direct passage or it may fuse with the bile in the ampulla. Brackertz has shown experimentally that even in the presence of pancreatic juice, the bile ducts are not involved. He believes this is due to the fact that there is much more elastic tissue underlying the mucosa of the ducts than is present in the wall of the gall bladder. The elastic tissue is very resistant to the action of pancreatic juice. In experiments in which he introduced pancreatic extract mixed with colon bacilli

into the common duct and obstructed the duct, marked changes took place in the wall of the gall bladder, but the ducts remained normal except for, at times, localized necrotic changes in the wall of the duct at the site of the duct puncture. It is therefore permissible to assume that without stasis and with normal anatomical and physiological mechanisms even though the duct bile may be mixed with pancreatic juice no pathological changes take place in the biliary passages.

With a low-grade stasis in the biliary passages such as may be produced by disturbed papillary function or by complete or incomplete obstruction at the duodenal end of the biliary and pancreatic ducts, the bile mixed with pancreatic juice may remain in the ducts for a considerable time, the bile-pancreatic juice ratio may be altered, and variable amounts of pancreatic juice may enter the gall bladder. The disturbance created in the gall bladder will then depend upon known and unknown factors. If the pancreatic juice content is low and no bacterial contamination is present, no changes may occur in the wall of the gall bladder. If, however, the pancreatic content is higher, the stasis prolonged, and possibly a low-grade bacterial contamination is present, changes may occur as described by Andrews, Goff, and Hrdina. They have shown with the introduction of pancreatic juice into the gall bladder of the dog that the cholesterol content of the bile is not altered, but that the concentration of the bile salts is reduced to less than one third. In five experiments with unfiltered pancreatic juice all the bile salts had been absorbed and the cholesterol precipitated. Therefore, in the human being the low dilution stage may be a factor in the production of gall stones. When the concentration of the pancreatic enzymes in the gall bladder is high, the pathological changes produced will depend upon complete or incomplete activation of the pancreatic enzymes in greater or lesser dilution in contact for short or long periods of time, sufficient time and concentration being necessary for necrosis.

It is not the purpose of this article to convey the idea that all cases of cholecystitis or gall stones are produced by a reflux of pancreatic juice into the gall bladder, however, the author is convinced that the cause of selected cases of acute necrosis and acute gangrenous cholecystitis and also cases of chronic cholecystitis with or without stone can be found in a reflux of pancreatic juice into the gall bladder.

HOWARD A. MCKNIGHT, M.D

Bernhard, F.: Newer Viewpoints Regarding Biliary Surgery (Ueber neuere Gesichtspunkte aus der Chirurgie der Gallenwege). 61 Tag d. deutsch. Ges. f. Chir., Berlin, 1937.

Following a gall-stone attack inflammation of the gall bladder is the greatest danger. The author points out that frequently also the liver and pancreas become involved and that their involvement predominates in the clinical picture. After a gall-stone attack the pancreas becomes involved quite frequently.

and manifests itself in an increased amount of diastase in the urine. Only rarely is a pure involvement of the liver found which leads to an increase of the fat splitting ferment in the blood stream. Lastly there is a third form in which both an involvement of the pancreas and of the liver takes place. The pancreas involvement is the most important as it causes a marked rigidity of the upper abdomen and an increased amount of diastase in the urine. In such cases operation should not be done until the inflammation of the pancreas has receded on account of the circulatory weakness. The increase in the amount of diastase in the urine is also important for the decision as to whether operation should be done or not as in clinically mild cases of gall stone disease the amount of diastase in the urine is frequently much greater than normal and shows that the gall stone disease is much more severe than the clinical symptoms suggest. In common duct stone there is an increase of the diastase in the blood in nearly every other case which must be taken into consideration in the decision as to whether the common duct should be opened or not. After operation involvement of the pancreas is manifested by an increased amount of diastase in the urine and an increase in the pulse rate which cannot be explained on any other basis. The determination of the amount of diastase in the urine for the diagnosis of gall stone disease is as important as the examination of the urine for albumin in kidney disease. In 32 fatal cases every third one showed involvement of the pancreas by an increased amount of diastase in the urine and this involvement was contributory to the death. Cholangiography after operation on the ducts should be employed more often than at present. Disturbances in the common duct are demonstrated much more easily by this method. Occasionally stones which have been left are demonstrable. At times the contrast medium will be found in the pancreatic duct. This phenomenon is not of much significance. After operation for gall stone disease other acute conditions which are frequently overlooked may set in. Spontaneous rupture of the common duct may develop or occasionally a rupture of the stump of the cystic duct these lead to biliary peritonitis. In 1 000 choledochotomies this occurred three times. In the latest series there were observed also 2 cases of pancreatic necrosis. This complication was observed three times in 3 000 cholecystectomies. Cirrhosis of the liver and diabetes are seen relatively frequently as late causes of death following gall bladder or gall duct operations. Cirrhosis occurs in cases which have come under treatment late and is based on a chronic cholangitis which is unable to recede. Diabetes develops also in cases in which operation has been delayed too long a time and in which the lithiasis has extended to the duct system. Cancer may also be the cause of late death. Cancer occurs much more frequently after operation on the common duct than after operation on the gall bladder. It is believed that cancer inducing substances may be formed from the cholesterol and from

the biliary acids. Cancer appears most often in cases which have been operated upon too late. Its frequency following gall stone disease may be reduced considerably by early operation and especially by operation before the disease involves the common duct.

In the discussion Finsterer states that for the past fifteen years he has replaced hepatic-duct drainage with supraduodenal common-duct duodenal anastomosis in cases of multiple stones in the hepatic duct, in severe suppurative cholangitis and in absolute or relative stenosis of the papilla. He believes that the free flow of bile into the bowel will cause rapid healing of the inflammation present and that the patient will remain cured even though a stone has to be left in the papilla. In fifteen years of the employment of this procedure he has never seen an ascending infection result in spite of wide anastomosis and in spite of filling of the branches of the hepatic duct during the x ray examination. Patients who had a severe suppurative cholangitis and came for operation healed quickly and have remained cured for ten years after the operation. The permanent cures in cases of common-duct obstruction which with the old procedure of cholecystectomy and hepatic duct drainage occurred in 40 per cent of the cases have been increased to 95 per cent in his own material with the newer procedure. The Finsterer has done 80 operations by this newer method and recommends it highly.

Kirschner pointed out the value of cholangiography during gall stone disease operations. He said the procedure will immediately demonstrate the situation or condition of the deep bile passages. It will show if stones or stenoses are present which will demand opening of the ducts or anastomosis with the duodenum or whether a simple cholecystectomy will suffice. As a contrast medium from 10 to 20 ccm of uroselectan are employed and introduced through a cannula tied into the cystic or common duct or introduced into the common duct by means of a Nelaton catheter. Kirschner showed the value of the method with numerous roentgenograms.

Orth stated that he pointed out the value of roentgenological demonstration of the gall bladder and bile passages in lithiasis, pancreatitis and cancer as far back as 1928.

L. A. JUVAN MD

Bengolea A J and Suárez G V. The Late Results in Plastic Surgery of the Biliary Tract (Los resultados alejados en la cirugía plástica de las vías biliares). *Rev méd quirurg de patol femenina* 1937 5 332

This article is a study of ascending infection in anastomoses between the biliary and gastro intestinal tracts based on the authors' experience and references to the literature. There are few reports of the final outcome in these anastomoses with judicial weighing of possible complications and the balance of results. The operations for purely palliative purposes cannot be counted either as successes or failures.

The authors discuss the technique of the various plastic operations on the biliary tract, their indications, complications, and results. They report in detail two cases of ascending cholangitis, one fatal, following choledochoduodenostomy for stone in the common duct. In their four cases of transduodenal papillotomy, reflux occurred in only one case, in which the communication between the common duct and duodenum was too large. In their two cases of hepaticoduodenostomy for postoperative cicatrices of the terminal portion of the common duct, the immediate results were good. One patient, however, died later from an ascending angiocholitis. The other had an obstinate ascending infection, which apparently yielded finally, following a cholecystogastrotomy. In their three cases of cholecystoduodenostomy, two for cancer of the head of the pancreas, the third for cicatricial obstruction of the common duct, reflux was demonstrated radiographically in all.

The authors' conclusions are that anastomoses between the biliary and gastro-intestinal tracts should be considered as operations of necessity. Their precise indication is irreducible obstruction, either neoplastic or cicatricial, of the common duct. Great care should be taken in broadening the indications to include calculous obstruction. The use of such operations in the so-called dyskinesias should be carefully controlled and limited to certain cases of jaundice due to irreducible pancreatic stenosis. Ascending infection is a very real and serious risk, as has been repeatedly proved clinically, radiologically, experimentally, and by autopsy. Experimentally it has been demonstrated that infection is more serious when the anastomosis is unduly ample, and that dilatation of the bile passages is due to infection and not to stasis.

The article is supplemented by radiographs, microphotographs, colored plates, and a bibliography.
M E MORSF, M D

MISCELLANEOUS

Scholl, R. Stab and Gunshot Injuries of the Abdomen (Ueber Stich- und Schussverletzungen des Abdomens). *Mitt a d Grenzgeb d Med u Chir*, 1936, 44 354

The author discusses 147 cases of injury treated at the Panzi Clinic during the decade from 1924 to 1934. Among these were 58 gunshot injuries, 35 from a revolver, 22 from a rifle ball, and 1 from shell fragments, and 89 stab wounds, only knife stabs. In only 22 cases the abdominal viscera were not injured, and 21 of these were punctured wounds. In gunshot injuries, involvement of the abdomen must almost always be taken into consideration. With few exceptions all of the cases were operated upon at once, but nevertheless, the mortality of the gunshot injuries was very great, namely, 55.4 per cent, whereas that of the stab wounds was 14.6 per cent. The time of the operation was of great importance. In gunshot injuries the mortality amounted to 21 per cent if operation was done within two

hours, 49.2 per cent if done within four hours, 83 per cent within twelve hours, and 100 per cent if done later. Even the apparently most harmless injuries must be operated upon at once. The Clinic usually followed the principle of continuing the stab wound in stab injuries and doing a median laparotomy in cases of gunshot injuries and in cases in which the peritoneum or intestines had become prolapsed. Intestinal perforations were usually sutured. In 26 cases the cause of death was peritonitis, and in 12 hemorrhage.

The reports on the individual visceral injuries present some interesting disclosures.

1 *Gastro-intestinal canal* There were 34 gastro-intestinal stab wounds and 40 shot wounds. The results in the former were relatively good, 14.7 per cent of the patients died, while in the latter they were poor, 60 per cent died. These results are due to the fact that usually several organs are involved simultaneously and the destruction is usually more severe. According to the author, it is not true that gunshot wounds of the small intestine are less infectious than those of the large intestine. The worst cases are the combinations of gunshot wounds of the small and large intestine, these made up 80 per cent of the total. Even in very small gunshot wounds of the intestine there is spontaneous agglutination, which might lead to spontaneous healing. There was only 1 patient with an isolated gunshot wound of the stomach who recovered, whereas there were 5 with isolated stab wounds of the stomach who recovered. In all cases of injury of the stomach, the posterior wall of that organ must be exposed by way of the omental bursa. Shot wounds of the stomach are almost always associated with injuries of the liver or other viscera. Also, shot injuries of the transverse colon and of the sigmoid flexure are almost always associated with injuries of the abdominal viscera. The author saw an isolated injury of the duodenum only once, and 22 stab wounds and 13 shot wounds in the peritoneum and mesentery. There always were other associated injuries. Intestinal prolapse from stab and shot wounds were more rare than described in the literature. It occurred in only 3 of 58 in the latter group, and in 37 of 89 in the former group. In 8 cases the abdominal viscera were not injured.

2 *Liver* Of 18 cases of perforation of the liver, the liver was injured alone in 16. All but 1 patient were operated upon, but 2 died from other causes. In the 19 cases of shot wounds of the liver, the liver was injured only twice, both patients recovered. As the liver is rarely hit alone by a shot, a conservative procedure is indicated with very few exceptions. Nevertheless, the mortality amounted to 68.4 per cent.

3 *Spleen* The spleen is also seldom injured alone. Four patients with stab wounds recovered, and 8 (80 per cent) of 10 patients with shot wounds died. Splenectomy is indicated. Suture and tamponade are indicated only very rarely, in none of the author's cases was the spleen torn to pieces.

and manifests itself in an increased amount of diastase in the urine. Only rarely is a pure involvement of the liver found which leads to an increase of the fat splitting ferment in the blood stream. Lastly there is a third form in which both an involvement of the pancreas and of the liver takes place. The pancreas involvement is the most important as it causes a marked rigidity of the upper abdomen and an increased amount of diastase in the urine. In such cases operation should not be done until the inflammation of the pancreas has receded on account of the circulatory weakness. The increase in the amount of diastase in the urine is also important for the decision as to whether operation should be done or not as in clinically mild cases of gall stone disease the amount of diastase in the urine is frequently much greater than normal, and shows that the gall stone disease is much more severe than the clinical symptoms suggest. In common duct stone there is an increase of the diastase in the blood in nearly every other case which must be taken into consideration in the decision as to whether the common duct should be opened or not. After operation involvement of the pancreas is manifested by an increased amount of diastase in the urine and an increase in the pulse rate which cannot be explained on any other basis. The determination of the amount of diastase in the urine for the diagnosis of gall stone disease is as important as the examination of the urine for albumin in kidney disease. In 32 fatal cases every third one showed involvement of the pancreas by an increased amount of diastase in the urine and this involvement was contributory to the death. Cholangiography after operation on the ducts should be employed more often than at present. Disturbances in the common duct are demonstrated much more easily by this method. Occasionally stones which have been left are demonstrable. At times the contrast medium will be found in the pancreatic duct. This phenomenon is not of much significance. After operation for gall stone disease other acute conditions which are frequently overlooked may set in. Spontaneous rupture of the common duct may develop or occasionally a rupture of the stump of the cystic duct these lead to biliary peritonitis. In 1,000 choledochotomies this occurred three times. In the latest series there were observed also 2 cases of pancreatic necrosis. This complication was observed three times in 3,000 cholecystectomies. Cirrhosis of the liver and diabetes are seen relatively frequently as late causes of death following gall bladder or gall duct operations. Cirrhosis occurs in cases which have come under treatment late and is based on a chronic cholangitis which is unable to recede. Diabetes develops also in cases in which operation has been delayed too long a time and in which the lithiasis has extended to the duct system. Cancer may also be the cause of late death. Cancer occurs much more frequently after operation on the common duct than after operation on the gall bladder. It is believed that cancer inducing substances may be formed from the cholesterol and from

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Bengtson A. J. and Suárez C. V. The Late Results in Plastic Surgery of the Biliary Tract (Los resultados alejados en la cirugía plástica de las vías biliares). *Revista de cirugía de países hispanos* 1937 5 332.

This article is a study of ascending infection in anastomoses between the biliary and gastro-intestinal tracts based on the authors' experience and references to the literature. There are few reports of the final outcome in these anastomoses with judicious weighing of possible complications and the balance of results. The operations for purely palliative purposes cannot be counted either as successes or failures.

GYNECOLOGY

UTERUS

Zondek, B.: The Effect of Long-Continued Large Doses of Follicle Hormone Upon the Uterus of the Rat. *Am. J. Obst. & Gynec.*, 1937, 33 979

The effect of long-continued treatment with follicle hormone on the uterus in the rat is described. Though the inhibitory effect upon the anterior lobe of the pituitary by follicle hormone, expressed in eunuchoid dwarfism, appears uniformly in all the animals, the local effect on the uterus itself varies widely. Sometimes there is no effect, sometimes a complete destruction of the uterus. The effect of the estrogenic hormone therefore varies individually. The following characteristic effects were established:

1. The epithelium showed a marked variability. The epithelial cells were absent in places, stratified and cylindrical in other places, and tufts and papillae projected into the lumen. There was desquamation of whole areas of the mucosa, with hydropic cells without visible cell boundaries. From partial to total metaplasia of the surface epithelium into stratified keratinized squamous epithelium had taken place, and the uterus gave the appearance of a vagina in estrus.

2. Metaplasia of the glands, a change of the normal glandular epithelium into squamous epithelium with prickle cells and intercellular bridges.

3. Inflammatory changes, leucocytic infiltration of the entire mucosa, a subepithelial wall of eosinophiles, transmigration of leucocytes into the uterine cavity, suppuration of the mucosa (pyometra), and destruction of the musculature with conversion of the uterine horns into pus sacs as thick as a thumb.

Suppuration of the uterus occurs also in rabbits as a result of long-continued treatment with follicle hormone. This suppuration is aseptic and occurs after thrombosis and resultant necrosis. In contrast to this there is a secondary infection in the case of the rat. The ovaries of the experimental animals show a high-grade atrophy, an occasional enlarged follicle, but never a corpus luteum.

EDWARD L. CORNELL, M.D.

Chauvin, E., Leroy, M., and Giscard, B.: Involvement of the Urinary Tract by Non-Treated Cervical Carcinoma (Retenissement du cancer du col utérin (non traité) sur l'appareil urinaire). *Rev. franç. de gynec. et d'obst.*, 1937, 32 431.

Urinary-tract involvement in carcinoma of the cervix occurs much earlier than is commonly supposed. The signs of the encroachment are obscure, and are, for the most part, neglected. Earlier recognition would doubtless lead to more active treatment and more certain cure. On this basis the authors proceed to elucidate this subject by describing (1) vesical lesions, (2) renal and ureteral lesions, and (3) the diagnosis of reno-ureteral involvement.

From their lengthy and detailed investigations they draw the following conclusions:

Tumors of the cervix inevitably extend toward the bladder and the pelvic portions of the ureters. The earliest involvement of these organs is through circulatory or inflammatory processes. The next stage involves compression of the urinary organs. The final stage is one of invasion.

Signs of involvement may be detected even in neoplasms which can scarcely be classified as International Grade I. Die elimination and retrograde ureterography show early static and dynamic changes.

Complete urological investigations are of value in determining the mode of treatment. When urinary involvement is occasioned purely by inflammatory or circulatory disturbances, surgical removal may safely be attempted. When the stage of compression has been reached surgical treatment must be viewed critically, especially if dense adhesions are present. When the final stage of invasion is reached, surgical removal is, of course, out of the question.

Mechanical and dynamic disturbances of the ureter are serious complications which may compromise renal function to such a degree that fatal uremia or anuria may result. It is of the utmost importance, therefore, from the standpoint of treatment as well as accurate prognosis, that a complete urological investigation be carried out.

Urine examinations give information concerning the degree of oliguria and the presence of possible infection. The phenolsulphonphthalein test furnishes a good index of renal function. Cystoscopy after the injection of indigo carmin confirms this information. By the form, force, and rhythm of the spurts of urine from the ureter, the urologist can detect evidence of early involvement of the pelvic portion of the ureter. Moreover, cystoscopy also reveals, by showing increased trabeculation and bullous edema, direct evidence of adhesions between the neoplasm and the bladder wall. Deviation of the urinary meatus toward the left indicates possible parametrial involvement. Intravenous urography outlines the site and the dimensions of ureteral hydronephroses. Retrograde ureteropyelography gives exact information concerning the state of the pelvic portion of the ureter. Straightening of the juxtavesical portion of the ureter indicates early parametrial involvement.

HAROLD C. MACK, M.D.

Puccioni, L.: Carcinoma of the Neck of the Uterus and of the Vagina in Young Women (Il cancro del collo dell'utero e della vagina nelle giovani donne). *Riv. ital. di gynec.*, 1937, 20 17.

Puccioni states that it is almost universally accepted that carcinoma occurs usually in mature age, but recent statistics have shown that also younger individuals and even children may be affected by this disease. The author has observed a relatively

4 *Pancreas* The pancreas is almost always associated with injuries of other organs. One stab wound and 1 gunshot injury were operated upon successfully. In the latter however numerous necrotic areas of fatty tissue, which are strikingly rare in shot injuries were found. Eight other patients with shot injuries of the pancreas died in spite of operation.

5 *Diaphragm* In stab wounds the direction was usually from the abdomen to the thorax in shot wounds it was the reverse. Most often the left side of the diaphragm was affected. In 5 of 12 stab wounds no abdominal viscus was affected, all of the patients were operated upon and recovered except 1 who died from aspiration of the gastric contents. In the cases of 17 shot injuries, always at least 1 abdominal viscus was injured. Only 4 patients recovered the mortality was 76.4 per cent.

6 *Kidney* Extraperitoneal injuries are more harmless than intraperitoneal. There were 3 patients with stab wounds of the kidney of which

1 died. There were 8 patients with shot wounds of the kidney, in which the peritoneum and also other organs were affected. They were all operated upon and 7 (87.5 per cent) of them died. The author favors operation in every case especially in cases of transperitoneal shots and thereby confirms the experience of the World War that there was too much conservatism in the beginning.

7 *Bladder* Three patients had shot injuries of the bladder. One died but from pneumonia. It is worthy of note that the suture of even extraperitoneal shot wounds held.

8 *Large abdominal blood vessels* There were 6 patients with stab wounds and 2 with gunshot injuries of the abdominal aorta and other vessels. Only 1 with a stab injury of the right gastric artery and simultaneous injuries of the stomach and liver and 1 with stab injury of the internal spermatic artery and simultaneous injury of the colon re-covered. 2 died from hemorrhage and 2 from peritonitis. (FRANZ) LOUIS NEUBERGER M.D.

in tabular form at the conclusion of this article. A few figures from this table serve to illustrate how frequently mild or severe complications are observed.

Of the minor complications, vaginitis occurred in 90 per cent, proctitis in 80 per cent, cystitis in from 15 to 20 per cent; and fever in 78 per cent. Grave complications occurred in 29.1 per cent, and late complications in 1.7 per cent. The mortality of the clinic patients was 4.3 per cent, and of the private patients, 3 per cent. Infections occurred in 3.7 per cent of the clinic patients and in 2.08 per cent of the private patients.

The authors conclude that while complications are more frequent than is commonly realized, the mortality and morbidity of radiation therapy does not compare to that charged to the surgical treatment of operable carcinoma. Great as the complications of radiation therapy may be, they are nevertheless a small price to pay for a form of therapy which is exceptionally efficacious and often offers the only hope in advanced cases. HAROLD C. MACK, M.D.

Rosset, W.: Sarcoma of the Uterus; Pathology and Clinical Aspects; Material of the University Gynecological Clinic at Freiburg since 1927 (*Das Uterussarkom, pathologische Anatomie und Klinik, sowie Material der Universitäts-Frauenklinik Freiburg seit 1927*) 1936 Freiburg: Br., Dissertation.

The author presents a detailed dissertation on the frequency, age incidence, and classification of uterine sarcoma in the wall and endometrium, as well as a description of the sites of the neoplasm in the body or cervix, its regressive changes, metastases, symptoms, diagnosis, clinical course, and prognosis. With the aid of numerous microscopic illustrations, the author describes the various histological types of uterine sarcoma: myosarcoma, round-cell sarcoma, spindle-cell sarcoma, giant-cell sarcoma, alveolar sarcoma, angiosarcoma, grape-like sarcoma, and carcinosarcoma. When at all possible, surgical treatment is to be preferred. Hysterectomy including removal of the adnexa may be performed by either the abdominal or vaginal routes. Irradiation therapy has accomplished little, only Wintz can report permanent cures in over 52 per cent of his cases with x-ray therapy alone. According to the author, radium therapy appears to give unusually poor results. Of the thirteen histologically proved cases, one was free from recurrence for three and one-half years, another for three and one-quarter years, and two, for nine and four months, respectively. Of the remaining nine cases, one could not be treated as the patient died promptly on admission to the clinic, two terminated fatally following operation, three terminated fatally from recurrences within one year after treatment, and one of recurrence four years after operation. Two other patients are alive, although suffering from recurrence. Of the twelve treated patients, ten were treated surgically, two, for general reasons, were subjected to irradiation therapy alone. The patients who have been cured to

date have been treated surgically. A case of grape-like sarcoma of the vagina which caused the death of a two-year-old child in the course of ten months is described in detail, and very instructive histological pictures of the tumor are shown.

(HUBERT) HAROLD C. MACK, M.D.

ADNEXAL AND PERIUTERINE CONDITIONS

Motta, G.: Torsion of the Normal Uterine Adnexa (*Sulla torsione degli annessi uterini normali*) *Arch. di ostet. e ginec.*, 1937, 15, 112.

Motta states that the clinical picture of torsion of the uterine adnexa has been well studied, but little is known about the mechanism by which this torsion occurs. It was formerly taught that torsion of the uterine adnexa can only occur in the presence of diseased tubes. Based on his experience the author believes, however, that torsion may also occur in normal uterine adnexa.

The case observed personally by the author was that of a thirty-four-year-old woman, a para-iii, who suddenly developed severe pain in the right lower abdominal quadrant accompanied by vomiting, vaginal bleeding, and elevation of temperature. Examination at the hospital revealed marked abdominal rigidity and in the region of the cul-de-sac there was found a mass about the size of an orange. A tentative diagnosis of a retro-uterine hematocoele was made.

Under ether anesthesia a pelvic laparotomy was performed, and after opening the peritoneum the right fallopian tube was inspected and found to be markedly enlarged and twisted on its longitudinal axis. The torsion involved the right uterine adnexa extending to a point about 1 cm. from the margin of the uterus. A portion of the broad ligament on that side was found to be stretched by the twisted tube. A subtotal removal of the uterus and its adnexa was performed. The postoperative course was good and the patient made an uneventful recovery.

Examination of the surgical specimen revealed a marked enlargement of the right uterine adnexa including the tube, mesosalpinx, ovary, mesovarium, and the broad ligament. Throughout the entire mass there were hemorrhagic infiltration and necrotic areas. Histological examination revealed an interstitial hemorrhagic infiltration which involved all the layers of the wall of the tube and obliterated completely its normal microscopic picture. There were no inflammatory changes and the left tube was found to be normal in every respect.

Motta subdivides cases of torsion of the uterine adnexa into (a) total torsion, when the entire adnexa are involved, and (b) partial torsion, when only the tubes or the ovaries are involved in the process. The right tube is predominantly affected and usually the torsion occurs at its isthmic portion.

The author concludes by stating that the term "total or partial torsion of the uterine adnexa" should be applied only in those cases in which the adnexa were originally normal. The mechanism of torsion in previously diseased adnexa is essentially

high incidence of carcinoma of the uterus and of the vagina in young women in the Clinic of Modena. He made a statistical study of these cases over a period of eight years and studied especially the clinicotherapeutic and anatomicopathological features of this condition. Only individuals up to thirty five years of age were included in this series.

Among a total of 1881 gynecological cases there were 125 women or 6.9 per cent with carcinoma of the cervix or of the vagina. Of these 125 patients there were 20 or 16 per cent who were less than thirty five years old. These figures are higher than those usually reported by other investigators.

Concerning heredity the author believes on the basis of his studies that carcinoma in general cannot be considered to be a hereditary disease in the true sense of the word. There seems to be a hereditary predisposition however which in the presence of certain carcinomatogenous agents may put the organism in a state of lesser resistance or susceptibility to the disease. In the author's series however this familial predisposition has not been found to be of any importance.

The obstetrical history of the patient seems to be of great importance. Pregnancy has been regarded as a notoriously important predisposing factor of carcinoma of the neck of the uterus. In nulliparas for instance carcinoma of the cervix is exceedingly rare. In the author's series there were only 3 cases in 125 women with a carcinoma of the cervix 1.6 per cent. Among the young women 100 per cent were multiparas and 3 women had a carcinoma of the cervix during pregnancy.

Concerning the macroscopic anatomicopathological picture of the tumors Puccioni states that he found an ulcerative type in 12 cases a proliferative type in 5 cases and a mixed type in 3 cases.

From a histological point of view there were 2 cases of adenocarcinoma and 12 cases of squamous cell epithelioma.

The percentage of operability was very high and greater than that observed by other investigators namely 77.7 per cent.

The results obtained from treatment were very satisfying and the rate of survival was about 60 per cent. In the author's opinion better results are obtained with surgical therapy than with mixed or actinic therapy.

RICHARD E. SOUTER, M.D.

Ducuing J. and Negre P. Complications of Radiation Therapy of Carcinoma of the Cervix (Complications du traitement du cancer du col par les radiations). *Rev. franç. de gynéc. et d'obst.* 1937 32: 355.

Radiation therapy of cervical carcinoma whether with the x rays or with radium is the cause of many complications often grave sometimes fatal. Two chief groups of complications are noted infection and radium and x ray lesions. Many of these complications are due to faulty technique which will be eliminated as progress in radiation therapy continues. The authors suggest that many of these

complications may be eliminated when direct contact of the radium with the lesion is replaced by x ray therapy or telecurietherapy radium at a distance. Direct application of the radium into the cervical canal has the evident disadvantage of impeding drainage stirring up or increasing the virulence of infecting organisms as well as producing direct tissue damage.

In this lengthy dissertation the authors discuss (1) infectious complications (2) radiation lesions and (3) complications observed in their own patients.

Infectious complications are the most frequent. Fever is commonly observed after radiation therapy. Opinions vary as to its cause and frequency. The authors noted fever in 6 per cent of their patients before treatment and in 46 per cent after treatment. Infection may involve the cervix uterine body parametrium adnexa peritoneum veins and blood stream. Predisposing factors in such infections are advanced age poor condition of the patient and advanced stage of the neoplasm. Preexisting infection in the genital tract or elsewhere in the body which is a contra indication to radiation therapy is often latent or overlooked. Dilatation of the cervix and traumatism play an important part which must not be overlooked. The technique of radium application endo uterine application its repeated application and vaginal tamponade also provides potential sources for infection. At the Toulouse Cancer Center 78 per cent of treated patients had slight and 10 per cent had severe infections after radiation therapy.

To prevent these infections the authors suggest (1) complete bacteriological study disinfection of the cervix electrocoagulation of the cervix and careful and complete cervical dilatation (2) choice of an applicator which does not completely obliterate the cervical canal (3) short intense continuous applications of radium (4) discontinuance of therapy when the temperature rises and (5) frequent change of dressings during treatment. Medical measures such as the administration of serum and intravenous saline solution and the application of ice to the abdomen as well as surgical procedures such as colpotomy may be necessary.

Pyometra a late complication of radiation therapy results from cervical stenosis. Technical faults trauma to the cervix and improper dosage may cause this condition. Prophylaxis is of the utmost importance. Surgical treatment aims to establish drainage bring about disinfection and effect systematic dilatation. Conical excision of the cervix or fundal hysterectomy are the procedures of choice.

In discussing the second group of complications i.e. radiation lesions per se the authors give detailed accounts of local as well as distant early as well as late injuries caused by x ray or radium irradiation. They discuss the effects of the rays upon the blood stream urinary tract intestinal tract genitalia and skin.

The complications which occurred in a series of 1200 clinic and privately treated patients are listed.

A frank family history of tuberculosis was rarely obtained. Eleven of thirty patients gave histories of pleurisy in the past, and in three instances tuberculous peritonitis was known to have affected these patients during childhood. Concomitant pulmonary involvement was not present, leading the author to raise the question whether these patients had a special predilection for tuberculosis of serous surfaces. Pre-existing gonococcal infection of the tubes was present in only one instance. Three patients had had pregnancies, one of the pregnancies was followed by puerperal infection. Six patients had had previous abortions. Sterility was the chief complaint of twelve of these women; in four it was the only symptom which caused them to seek medical aid. The author emphasizes that sterility is an important finding in adnexal tuberculosis. This relationship must always be borne in mind when a case of sterility is presented.

Amenorrhea was noted in only four cases, three patients complained of menometrorrhagia, and dysmenorrhea was noted in 50 per cent. Generally speaking, the author found little that was symptomatic of tuberculous infection of the pelvic organs, pain was usually not severe; there was usually no profound debilitating effect upon the patient, which was contrary to common opinion, fever was or was not present, and subnormal temperatures were not infrequent at the onset. The pulse rate varied, ranging from 80 to 100 per minute. In twenty patients the acceleration of the pulse was out of proportion to the temperature elevation. The author feels that this fact is of some diagnostic value.

Laboratory studies, such as leucocyte counts, sedimentation rate, tuberculin tests, guinea-pig inoculation, and the Besredka reaction, are discussed. With the exception of guinea-pig inoculation of exudate obtained by cul-de-sac puncture, the author finds little of value in laboratory procedures. Prolonged sedimentation rates during afebrile periods are somewhat suggestive. Exploratory laparotomy must often be employed.

With the means enumerated above, the author was able to make a clinical diagnosis in five instances. In five other cases a bacteriological diagnosis was made.

HAROLD C. MACK, M.D.

Simard, L. C.: Primary Chorionepithelioma of the Ovary. A Report of Two Cases. *Am J Cancer*, 1937, 30: 298

Primary chorionepitheliomas of the ovary are of particular interest because of their rarity and because their exact origin is still open to discussion. The author reports two cases which showed unusual features, one in its structure, and the other in its clinical manifestations.

The author's first patient, a woman aged forty-two years, gave a history of continuous uterine bleeding from June, 1929, to March, 1930. At the latter date the hemorrhage ceased and the patient became aware of a mass in her abdomen. There had been no history of pregnancy in the five years previous. A

diagnosis of pedunculated fibroma of the left horn of the uterus was made.

At operation it was found that the tumor was in the left ovary, and a subtotal hysterectomy with bilateral salpingo-oophorectomy was performed. The ovarian tumor weighed 410 gm. and measured 16 by 10 by 9 cm. The histological diagnosis was chorionepithelioma. Two weeks after discharge from the hospital the patient was bedridden with shortness of breath, persistent cough, pallor, and marked emaciation. The x-rays gave evidence of metastases in the lungs. The patient died two months after the operation. The important findings at autopsy were as follows:

There were no evidences of recurrence or metastases in the abdomen. The mucosa of the uterus and tubes showed no modification. The pulmonary metastases were of the same histological structure as the primary tumor. There was absolutely no doubt about the diagnosis of chorionepithelioma.

In the pathological study of the first case one of the fragments was worthy of special mention. It was formed by ovarian stroma which was barely modified by the edema and was bordered by the invading chorionepithelioma. Many vessels of small caliber revealed around their endothelial lining a thick sheath made up of several layers of cells. These cells were large, and were round, oval, or club-shaped. Each cell was sheathed by a delicate collagen lining. The cytoplasm of the cells, which was transparent, clear, and acidophilic, contained fine granulations stained blue by phosphotungstic hematoxylin, and black by iron hematoxylin. The nucleus, swollen and lacking in chromatin, was oval and was located in the center of the protoplasm.

The author assumes that the decidual cells were formed from the connective-tissue cells of the ovary, or that these perivascular cells would have the same significance as decidual cells. The fact is worthy of mention because never to his knowledge have such elements been described in relation to a primary ovarian chorionepithelioma. Interest is augmented by the fact that this is likely to throw light on the causality of decidual cells. In normal pregnancy decidual reaction has been attributed to several hormones, estrin, folliculin, and the placental hormone. In this case the last hormone seems to play a part as the tumor is formed exclusively of a pure culture of chorionoplacental elements. It would seem then that the decidual cells in the ovary, which have been described, are attributable to the chorionepithelioma, and it would follow that the decidual cells in normal pregnancy are attributable to a chorionoplacental hormone.

The second patient was a virgin seventeen years of age with a tumor in the right lower quadrant. At operation a mass attached to the right ovary and about the size of a baby's head was removed. At this time both the urine and a specimen of the tumor gave a strongly positive Aschheim-Zondek reaction. The patient died four months after an uneventful recovery, but no details as to the circumstances of

the same as that of cystic or solid tumors of these organs. The mechanism of torsion of originally normal adnexa appears to be totally different. Many theories have been advanced in this respect but the most plausible one is the hemodynamic theory suggested by Fayr. This investigator believes that torsion occurs in these cases mainly as the result of an abnormally ample broad ligament. In the presence of subsequent circulatory disturbances torsion of the adnexa is apt to ensue. **Richard E. Sontag, M.D.**

Mocquot, P. Conservative Operations in Bilateral Adnexitis (L'opération conservatrice type dans les annexites bilatérales). *Gyn et obst* 1937 35 241

In cases in which there is bilateral inflammation of the adnexa, the reproductive function is lost, but the endocrine balance and the menstrual cycle can be maintained by conservative operation. There are three types of operation which maintain the utero-ovarian synergy: (1) removal of the two tubes and as a rule one ovary with preservation of the uterus and a sufficient quantity of normal ovarian tissue; (2) fundus hysterectomy and resection of the fundus of the uterus in addition to the procedures listed in (1); and (3) bilateral removal of the adnexa with preservation of the uterus and an ovarian graft.

There is another possibility if it is not desirable to preserve the body of the uterus: this is an operation suggested by Budmich which consists in a subtotal hysterectomy with an oblique V-shaped section of the cervix and a graft of a fragment of the endometrium between the two flaps and also an ovarian graft. This operation prevents menopausal disturbances for a time, but they appear later although in diminished severity. Fundus hysterectomy is a valuable operation but it is more difficult than the others; also the preserved ovary receives its blood supply only from the utero-ovarian artery which may be insufficient to preserve its function. Nevertheless the author has employed this operation in some cases of bilateral adnexitis with retroversion complicated by adhesions. He prefers the first type of conservative operation. At first he used it with some hesitation in young women whom he did not wish to castrate. The operation removes only those organs that have lost their function and leaves *in situ* organs that maintain the endocrine balance and the menstrual cycle. He has performed it in fourteen cases; two of the patients could not be traced; twelve have been re-examined from three months to two years after the operation. Of these eight were free from symptoms and menstruated regularly; four others had some pain; abundant menstruation and enlargement of the remaining ovary; one had a gonorrheal reinfection. In general the women were in definitely better condition than those in whom a hysterectomy had been done.

Recently the author's assistant Gresse in a Paris Thesis 1936, collected thirty cases in which

this operation had been done in the author's clinic in the period from 1926 to 1935. Of the thirty patients twenty-six had non-specific, and four tuberculous adnexitis which was proved at operation. Of the twenty-six patients one died four days after operation with signs of peritonitis. Eight of these patients could not be traced. Three had recurrences and required a secondary operation; in two the condition was not entirely suited for this type of operation as a suppurative salpingitis was present and in the third the author believed that the recurrence of symptoms was in part due to a psychoneurotic condition. In twelve patients a good result was obtained with relief of symptoms and normal menstruation; in two there was some pain especially at the menstrual period and leucorrhoea but these patients carried on all their normal activities.

Of the four patients with tuberculous adnexitis one was not traced; of the other three, only one showed a satisfactory result. The last was subsequently operated for tuberculous nephritis but had no further pelvic symptoms and was in good health nine years after operation.

None of the patients was over thirty-six years of age and only nine were more than thirty. So conservative an operation is not indicated in older women except in exceptional cases. It should be done only in cases without fever or severe general symptoms; it is best done within a week after a menstrual period. The uterus should be normal in position and in size; if there has been any metrorrhagia very careful examination is necessary to exclude a tumor or other lesion that would make it undesirable to preserve the uterus. A decision can be made after the abdomen is open. There must be sufficient normal ovarian tissue for preservation and sufficient normal peritoneum to ensure successful peritonization of the true pelvis when the operation is completed. The presence of pus in the tubes is not a contra-indication to the operation but care must be taken to avoid soiling the peritoneum or the pelvic cavity in evacuating the pus and removing the tubes. In some cases this conservative operation has given better results than were expected in spite of extensive lesions. Two illustrative cases are cited. Care must be taken to ensure a sufficient blood supply on the side on which the ovary or a part of it is to be left *in situ* by preserving the arterial arch formed by the uterine and utero-ovarian arteries. **Lucie M. Meyers**

Held, E. A Clinical Study of Adnexal Tuberculosis (Etude clinique de la tuberculose annexielle). *Gyn et obst* 1937 35 327

The diagnosis of pelvic tuberculosis is always difficult to make. Most often this condition is recognized only after histological examination. The author presents a series of thirty cases of this condition observed over a period of five years. All were proved histologically or bacteriologically. He points out the salient clinical features of this disease.

functionating mucosa Impregnation of the tissue with Lugol's solution gave a distinct, though slight, glycogen reaction near the surface In certain areas the mucosa was ulcerated, the underlying layers showing signs of congestion and inflammation

During a period of eight days following admission to the hospital the patient received 40 mgm of estradiol Benzoate (estrogenic hormone) by intramuscular injections Itching ceased two weeks after the onset of treatment Biopsy at this time showed regeneration of the mucosa, and clear-cut activity of the basal functional layer with numerous mitotic figures Impregnation with Lugol's solution showed glycogen in large amounts

The authors believe that this case illustrates the physiology of the vagina, namely, that the vagina is under the control of the ovary Their studies of the vaginal mucosa in cases of hyperhormonal amenorrhea showed excessive vaginal reaction, quite the contrary of that observed in amenorrhea accompanied by infantilism They believe that the vagina promptly reflects the folliculin balance within the body.

The authors next discuss the relationship between glycogen and vaginal acidity. This state of acidity, found only in the human female, is necessary to protect the genitalia against ascending infection. The acidity results from a transformation of glycogen to lactic acid aided by the Doederlein bacillus. Ovarian activity thus indirectly maintains vaginal acidity. The presence of glycogen in the vaginal mucosa for from ten to twelve years following the menopause is difficult to explain if ovarian activity alone is responsible Presumably some degree of ovarian activity, even if not enough to bring about menstruation, may persist even after the climacteric If this is true, kraurosis vulvæ or pruritus vulvæ may represent the results of extreme degrees of ovarian involution On the other hand, even after surgical castration, some glycogen persists in the vaginal mucosa, even though the amount is generally less than after the normal menopause. Further information concerning glycogen metabolism is necessary to clarify these points Perhaps the pancreatic insulin plays some rôle in this, with the ovarian hormone acting in a supplementary manner to fix the hormone in the tissues Whatever the relationship may be, it appears that the administration of ovarian hormone in large amounts is capable of re-establishing the function of the vaginal mucosa Relief of pruritus may be due to the vaginal regeneration, or perhaps it is brought about by diminished excitability of the sympathetic nerve endings

HAROLD C MACK, M D

Taussig, F J.: Sarcoma of the Vulva. *Am J Obst & Gynec*, 1937, 33 1017

Two cases, a liposarcoma of the labium majus and a lymphosarcoma of the clitoris were seen Liposarcoma has been found in the uterus, the mammary gland, the kidney, the bones, and the extremities Each case is given in detail, together with photo-

micrographs These two cases fit in closely with the clinical course of sarcoma of the vulva as previously described Frank says, "They resemble fibromata until ulceration and infiltration takes place Early tendency to recurrence is the rule and multiple metastases may develop The lymphatic glands are rarely affected, thus differing from carcinoma and melanoma" Lynch considers the prognosis grave Death appears to result uniformly in cases in which the diagnosis of vulvar sarcoma is firmly established The diagnosis is usually made only after the disease is far advanced, hence, the treatment is usually very unsatisfactory.

Surgery of the primary tumor is usually preferable to radiation and is ordinarily not attended by any difficulties Only one case is on record in which a five-year freedom from recurrence was reported The value of radium or deep x-ray therapy seems very questionable All in all, sarcoma of the vulva presents at the present time a rather hopeless picture

EDWARD L CORNELL, M D.

Margarucci, O.: Primary Carcinoma of the Gland of Bartholin (Carcinoma primitivo della ghiandola del Bartolini) *Clin ostet*, 1937, 39 265

The author reports a case of primary carcinoma of the left Bartholin gland occurring in a sixty-three-year-old female who entered the hospital because of a swelling in the vagina

The swelling proved to be a solid, egg-sized tumor arising from the left labium majus in the region of the gland of Bartholin and extending upward into the lateral vaginal wall, the rectovaginal septum, and the perineum On the medial surface there was an ulcerated area from which a serosanguinous fluid exuded The lymphatic chains along both inguinal regions were free of any palpable nodules, and the internal genitalia were entirely negative

The patient was subjected to a preliminary sigmoidostomy, wide excision of the tumor mass, and later, removal of the left inguinal lymph chain for a metastatic nodule, and closure of the sigmoidostomy

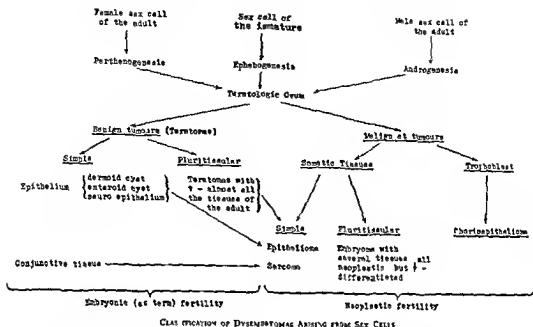
The patient made an uneventful recovery and histological preparations proved the lesion to be a malpighian epithelioma arising from the left gland of Bartholin.

GEORGE C FINOLA, M D

Scoppetta, G.: Cysts of the Vagina (Contributo allo studio delle cisti della vagina) *Polictir*, Rome, 1937, 44 sez. chir p 263

The author describes two cases of cyst of the vagina which he has operated on recently. The first was that of a woman of twenty-six years with a cyst on the posterior wall of the vagina It had begun at the time of her first sexual contact six years ago The second was that of a woman of thirty-five years with a cyst on the anterior wall of the vagina Both of the cysts were resected, and recovery was uneventful There was no evidence of trauma or inflammation as the cause of the cyst in either case

There was no difficulty in the clinical diagnosis of these cases, and their chief interest lies in their etiol-



her death could be obtained and no autopsy was performed. The pathological report in this case was chorioneplithelioma.

The author gives a rather complete resume of cases of chorioneplithelioma of the ovary found in the literature and he reports that the cause of this condition is ascribed to different origins by different authors. He summarizes the various theories which have been suggested in explanation of chorioneplithelioma of the ovary as follows: (1) malignant transformation in the ovary of chorionplacental cell carried from the uterus or the tube following pregnancy; (2) malignant transformation in the ovary of trophoblastic elements following ovarian pregnancy; (3) ovarian metastases of primary chorion epithelioma of the uterus or of the tube and (4) malignant transformation of the trophoblast in ovarian parthenogenesis as suggested by Loeb in 1911.

In both cases reported the author could not logically presume that there had been a previous pregnancy, either entopic or ectopic. There was no suggestion of recent abortion in either case. And moreover the uterine and tubal mucosae were not altered and contained none of the elements of pregnancy.

The author makes several interesting comments regarding the theory of Loeb as to the malignant transformation of the trophoblast in ovarian parthenogenesis. His article includes a classification of dysembryomas arising from sex cells and he has quoted many authors in support of the theory of parthenogenetic origin of primary chorioneplithelioma of the ovary.

Thus the theory of parthenogenetic origin of almost all of the teratomas and the chorioneplitheliomas of the gonads is more and more generally accepted. The teratomas would originate from parthenogenesis in the adult ovary from androgenesis in the adult testicle and from epigenesis in the gonads before puberty. The chorion epithelioma would arise independent of normal fertilization from the ectoderm of the teratological ova in the first state of their development. The parthenogenetic hypothesis seems to have begun to be demonstrated. It offers a better explanation of the benign or malignant forms of the majority of the dysembryomas.

ALBERT MATTHEY, M.D.

EXTERNAL GENITALIA

Cotte C. and Milleff A. Histophysiological Data On the Treatment of Pruritus Vulvae by Means of Folliculin (Données histophysologiques sur le traitement du prurit vulvaire sénile par la folliculine). *Gynécologie* 1937 3 105.

The authors describe a case of pruritus vulvae in a sixty-eight-year-old woman who entered the menopause at the age of fifty. Her general health had always been good. Itching of the vulva began two years previously following an attack of intercostal neuralgia on the right side. When the woman was admitted to the hospital for study none of the usual causes of pruritus were found. Biopsy of the vagina was made by excising a small section of mucosa in the region of the posterior cul-de-sac. Histological study revealed an atrophic non

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Reynolds, S. R. M.: Chronic Uterine Distention and Its Relation to the End of Gestation. *Am J Obst & Gynec*, 1937, 33: 968

A review of the local physiological effects of chronic uterine distention under various hormonal conditions is given. It is shown that uterine growth resulting from distention takes place in untreated, ovariectomized rabbits and in rabbits under the influence of progesterin. When estrin is the predominant hormone, the capacity of the distended uterus to grow is appreciably reduced.

With these facts as a basis, analysis is made of Hammond's data on uterine and fetal weights at different stages of gestation in the rabbit. It is shown that a disproportion exists between the growth of the fetus and that of the uterus in the last third of pregnancy, the former being much more rapid than the latter. It is shown also that the reason for the increasing disproportion of these growth rates is due largely if not entirely to an increase in the influence of the hormone, estrin. Mention is also made of the fact that estrin is the hormone which has been demonstrated to have the property of imparting rhythmic contractility to the uterus. As a consequence of the limitation of the capacity of the uterus to grow, along with the continued increase in the size of its contents, the developing rhythmic uterine contractions are rendered increasingly more efficient and forceful. The theory is advanced, therefore, that these physiological conditions are essential to the onset of labor, and that the commencement of parturition is most likely the result of a convergence of these conditions, which brings about nutritional changes and an appropriate physical orientation of the fetus.

The common physiological basis between the conditions which favor the onset of labor and those which may be responsible for spontaneous abortion is discussed.

EDWARD L. CORNELL, M.D.

Puett, T.: Extrauterine Pregnancies (Ueber Extra-uterin-graviditäten). *Monatsschr f Geburtsh u Gynaek*, 1936, 104: 57

The author presents an extensive review of 300 cases of extra-uterine pregnancy operated upon at the Essen Municipal Gynecological Clinic during the period from January 1, 1924, to July 31, 1935. In 297 patients there was a tubal pregnancy, and in 1 of these bilateral tubal abortion occurred. In 7 cases the site of the pregnancy was in the interstitial part of the tube, in 101 cases in the isthmus part, and in 164 cases in the ampullar part. In the remaining cases the site was no longer demonstrable. One hundred and forty-six tubal ruptures and 141 tubal abortions were observed. Ten tubal pregnancies were still intact at the time of operation. In 1 case a

full-term secondary abdominal pregnancy was found in a woman thirty-nine years of age. At the operation, a macerated fetus 53 cm long was delivered. In addition, 2 ovarian pregnancies (0.67 per cent) were observed. The author also discusses the cause, treatment, and diagnosis on the basis of 106 cases treated during the last three and one-half years under the directorship of Hilgenberg.

The average age of the patients was figured at thirty-one and three-quarters years, from which it is concluded that in the majority of cases the causes for the occurrence of an extra-uterine pregnancy are not of a congenital nature, but are only acquired at a sexually mature age. The predominantly etiological significance of the inflammatory changes of the genital organs is shown unequivocally by the operative findings. For example, in 16 of 69 cases, in which no former pelvic diseases were mentioned in the past history, old macroscopically visible pelvoperitonitic sequelae were found. In 16 patients ovarian cysts were found.

Nothing special was reported regarding the symptomatology. The Cullen sign was observed once. The insertion of a speculum in 2 cases of tubal rupture showed that the cul-de-sac of Douglas shines through bluish. Only 38 of 106 patients were brought into the hospital with the correct diagnosis. The diagnostic aids include the sedimentation rapidity of the leucocytes by the Westergreen method, examination under anesthesia, exploratory puncture of the cul-de-sac of Douglas, the exploratory curettage, the exploratory laparotomy, and the Aschheim-Zondek reaction. In 2 cases in which laparotomy was done on the basis of an exploratory puncture there were corpus luteum hemorrhages, once combined with an adenomyosis of the tube.

With regard to therapy, it is claimed that every recognized extra-uterine pregnancy should be operated upon immediately. With great loss of blood, an intramuscular sodium-chloride infusion or an intravenous constant-drop infusion of adrenalin was given. The number of fatalities amounted to 6 (2 per cent). Two of the patients died from weakness of the circulation, 1 from sepsis, 1 from peritonitis, and 2 from anemia.

(KARL KOCH) LOUIS NEUWELT, M.D.

Manzi, L.: The Remote Results of the Therapy of Extra-Uterine Pregnancy (I risultati remoti della terapia della gravidanza extra uterina). *Arch di ostet. e ginec*, 1937, 15: 130

Manzi studied a vast series of cases of extra-uterine pregnancy in the Obstetrical Clinic in Naples over a period of sixteen years in an attempt to determine the value of conservative treatment in these cases. The common methods of treatment of extra-uterine pregnancy are removal of the uterine adnexa, colpotomy, and medical therapy.

ogy The cysts have been attributed to the most varied causes including trauma and inflammations of various kinds The author thinks that in his two cases at least they developed from embryonic rests The one on the posterior wall was probably derived from cells of Mueller's ducts It is impossible to say whether the other cyst developed from Mueller's ducts or the wolffian ducts Some authors say that if these cysts develop from Mueller's ducts there are always other anomalies in the genital tract There were no such anomalies in either of these cases Sometimes muellerian cysts result from incomplete fusion of the two ducts of Mueller and represent a true rudimentary vagina In other cases they originate from aberrant epithelial cells of these ducts which have become detached during development

AUDREY GOSS MORGAN M D

MISCELLANEOUS

Cotte G Resection of the Presacral Nerve in the Treatment of Obstinate Dysmenorrhea *Am J Obst & Gynec* 1937 33 1034

Resection of the presacral nerve is now regarded favorably by many surgeons as the treatment of obstinate dysmenorrhea After an experience of twelve years with the operation the author is convinced of the value of resection of the presacral nerve in every syndrome associated with an anatomical or functional disturbance of the hypogastric plexus When ever the indications were properly observed and the operation correctly performed the results conformed to those described in the author's communications

The mortality rate is that of all simple aseptic abdominal operations about 1 per cent In more than 300 operations only two patients died from acute pulmonary complications The author has never noted any abdominal complication immediately or subsequently nor any trouble with the sphincters or with the genital organs More than 50 patients have had pregnancies at a later date and no accident was noted during parturition

In the absence of precise and certain physiological data concerning the nature and origin of the constituents of the presacral nerve it is difficult to explain the successful results of presacral sympathectomy

When all of the known therapeutic measures have been ineffective it seems wisest to advise early operation Furthermore there is the possibility that a slight anatomical lesion such as ovarian endometriosis or adenomyosis of the cornua which had not been discovered by clinical examination may be found and its treatment may be sufficient to relieve the dysmenorrhea

EDWARD L CORNELL M D

Schockaert J A and De Cooman E Actinomycosis of the Female Genitalia Case Report (*L'actinomycose génitale de la femme relation d'un cas personnel*) *Bruxelles med* 1937 17 1135

After a short historical review of the disease the authors present a detailed report of a case of primary actinomycosis of the female genitalia under observation at the University of Bruxelles

The patient had been referred to the hospital because of severe pain in both iliac fossae and the lower abdomen marked dysuria, constipation and amenorrhea of 1 year's duration Some six months prior to admission she had had a colpotomy performed for the same condition which was diagnosed as a large pelvic abscess

The physical examination showed the usual generalized changes associated with prolonged illness On bimanual examination the entire pelvis was found to be filled with a hard infiltrating mass which obscured the outlines of all the pelvic organs and extended upward to the level of the umbilicus A diagnosis of tuberculous adnexitis or old chronic pelvic disease was made and after transfusion the patient was subjected to laparotomy with removal of the uterus ovaries and tubes the latter having been converted into a huge bilateral pyosalpinx Histological preparations revealed typical lesions of actinomycosis composed of concentric layers of mycelium leucocytes epithelioid and giant cells lymphocytes and sclerotic bands of fibrous tissue

The patient made an uneventful recovery but refused x ray treatment only to return several weeks later with an abdominal wall abscess along the left iliac fossa anteriorly Drainage of the abscess potassium iodide heat diathermy and x ray treatment were instituted and the patient made a complete recovery

GEORGE C FINLAY M D

logical appearance of a placenta containing spirochetes is discussed

While thorough antisyphilitic treatment may not cause the disappearance of spirochetes from the placenta, it is nonetheless indicated as it assures apparently healthy full-term babies in about 90 per cent of the cases.

EDWARD L. CORNELL, M D

Caffaratto, T. M.: Several Cases of Hemorrhage from Rupture of the Umbilical Vessels in Velamentous Insertion of the Cord (Alcuni casi di emorragia da rottura di vasi ombelicali nell'inserzione velamentosa del funicolo) *Ginecologia*, Torino, 1937, 3 364

Spontaneous rupture of the umbilical cord, either partial or complete, is one of the gravest complications that can jeopardize the life of the fetus. Two complete ruptures in 14,000 cases, according to Forsell, and 8 in 4,000, according to Ahlfeld, emphasize the incidence of this accident. The site most frequently found to rupture was the fetal extremity, this finding occurred in 80 per cent of Winckel's cases and 77 per cent of Klein's.

Occasionally the accident involves only a blood vessel, and the bleeding may find its way into the amniotic cavity and burrow along the cord to form a so-called funicular hematoma, as reported by Stocker, Couvelaire, and others, or more frequently rupture of an abnormally placed vessel, such as that in velamentous insertion of the cord, occurs. The incidence of velamentous insertion of the cord has been variously estimated, Rhemann places it at 3 per cent while Noldeke places it at 11 per cent.

Winckel states that 6 per cent of all macerated fetuses and 58 per cent of all premature births are due to this complication. Gilfrich states that 58 per cent of all abortions are a result of ruptured blood vessels in velamentous insertion of the cord.

The author reports 3 cases of spontaneous rupture of the vessels in a velamentous insertion of the cord with a fetal mortality of 66 per cent. The cause is mechanical rupture of an abnormally placed vessel at the site where rupture of the membranes normally occurs. The diagnosis, as well as the differential diagnosis, was found to be impossible prior to delivery. The treatment is entirely prophylactic, it consists of mechanical rupture of the membranes only on direct vision, and careful manipulation of the tight cords as well as the cords around the neck. The high mortality rate will be reduced only when a method of diagnosis is found.

GEORGE C. FINOLA, M D

Stander, H. J., and Kuder, K.: The Treatment of Heart Disease Complicating Pregnancy. *J Am M Ass.*, 1937, 108 2092

There is a definite effect of gestation on the cardiac output, as shown by experimental work on the minute volume in both animals and the human being. The amount of work performed by the heart starts to increase during the first trimester of pregnancy and at term is approximately 50 per cent

above the normal non-pregnant level. Although without experimental proof, there can be little doubt that labor demands a further and perhaps marked increase in the minute volume of the heart.

The authors are of the definite opinion that the functional classification of the New York Heart Association is of more value as an aid in the treatment of the pregnant patient suffering from heart disease than the anatomical classification. This is as follows:

Class 1. Patients with organic heart disease able to carry on ordinary physical activity without discomfort. Ordinary physical activity does not cause undue fatigue, palpitation, dyspnea, or chest pain. Patients in this class do not show physical signs of cardiac insufficiency and rarely signs of active heart infection.

Class 2. Patients with organic heart disease unable to carry on ordinary physical activity without discomfort.

(a) Activity slightly limited. Ordinary physical activity causes undue fatigue, palpitation, dyspnea, or chest pain. Patients in this class rarely show physical signs of cardiac insufficiency or signs of active heart infection.

(b) Activity greatly limited. Less than ordinary physical activity causes fatigue, palpitation, dyspnea, or chest pain. Patients in this class usually show one or more physical signs of cardiac insufficiency, the anginal syndrome, or signs of active heart infection.

Class 3. Patients with organic heart disease and with symptoms or signs of cardiac insufficiency at rest, and unable to carry on any physical activity without discomfort. There is fatigue, palpitation, dyspnea, or chest pain at rest. Patients in this class show marked physical signs of cardiac insufficiency, the anginal syndrome, or signs of active heart infection.

In the authors' series there were 418 pregnant patients suffering from cardiac disease. About 85 per cent of these patients had the milder types of involvement, which are grouped as Class 1 and Class 2a heart disease. The remaining patients suffered from serious heart disease, and are grouped as Class 2b and Class 3. They formed the group in which the maternal deaths from heart disease occurred. To a large extent cardiac disease accounted for the total uncorrected maternal mortality in a series of 18,207 consecutive obstetrical discharges in four and one-third years at the Lying-in Hospital.

In 14,157 obstetrical patients discharged from the hospital, the incidence of cardiac disease was 3.97 per cent. The maternal mortality was almost three times as high in cardiac patients as in the total hospital patients.

Patients suffering from mitral stenosis and insufficiency constitute more than 40 per cent of all cardiac patients, while approximately 20 per cent have both mitral and aortic lesions. Mitral stenosis accounts for 18 per cent and aortic lesions for 1.44 per cent. Only 2 of the 418 patients had definite

In studying this problem the author considered mainly the remote effects resulting from these forms of therapy with special reference to the restoration of sexual function and the ability to conceive. Most of the disagreement arises in those cases in which the ectopic pregnancy has not ruptured and in which there is no evidence of an anemia. For these cases many investigators still advocate medical therapy or surgical intervention through the vaginal route although the author and his collaborators are strongly in favor of a pelvic laparotomy. Colpotomy and medical therapy are indicated only in those cases in which the hematocoele has become infected or in which there are certain local or general conditions which strongly contra indicate a pelvic laparotomy.

The size of the ectopic mass is no criterion for the type of intervention which is chosen. The author performs pelvic laparotomies even in cases in which the ectopic pregnancy is presumably small.

In general Manni is of the opinion that the best treatment of ectopic pregnancy is surgical through the abdominal route because with this method long recoveries, dysfunctions of the generative system, irregular menstruations, permanent sterility and other complications of mechanical or infectious character can be easily avoided.

With reference to the rarer types of extra uterine pregnancy ovarian or abdominal pregnancies practically all investigators agree that the intervention should be performed through the abdominal route and during the first five months as soon as the diagnosis has been made. In older pregnancies in which the fetus is alive the intervention should be postponed until the child is viable while the mother is being carefully watched. The reason for this postponement is that in absence of complications during the earlier months of pregnancy the ovum has probably found favorable conditions of growth in the abdomen and the danger of subsequent accidents in the mother is greatly minimized under these circumstances.

Concerning the use of x ray therapy in extra uterine pregnancy the author agrees with Spanelli that it is indicated even in cases in which the hematocoele has already formed. The implanted ovum as well as the surrounding chorionic elements are strongly sensitive to actinic radiation even in small doses. With this method the pregnancy may be promptly interrupted and the proliferation of chorionic villi is arrested. If a hematocoele has already formed x rays will favor its absorption. X ray therapy however should be used in the author's opinion with the limitations mentioned i.e. if a pelvic laparotomy is contra indicated or if the patient objects to the operation. If x ray therapy is chosen the diagnosis of ectopic pregnancy combined with a hydrosalpinx with other adnexal lesions or with a concomitant ectopic pregnancy should be definitely ruled out.

After having tabulated the results obtained from a series of cases the author concludes by stating that the method of choice in cases of ectopic pregnancy is

surgical through the abdominal route. The vaginal route should be chosen only in cases of infected hematocoeles which have become extricated in the cul de sac. Medical and actinic therapy should be used only if certain local or general contra indications exist. Conservative surgery through the abdominal route yields the best results especially with reference to the restoration of sexual function and the prevention of sterility.

Recurring ectopic pregnancies are so rare that they do not need to be considered here.

RICHARD E. SONNEN, M.D.

Robecchi E and Zocchi S. X ray Diagnosis of Placenta Previa (La diagnosi radiologica di placenta previa). Ginecologia Torino 1937 3 334

The authors report their experience with the Ude and Urner method of x ray diagnosis of placenta previa. The method consists essentially of introducing a radio-opaque solution into the bladder, and interpreting the relationship of the roentgenographic outlines cast by the fetal head and the urinary bladder.

In a series of thirty four patients with bleeding three were in the seventh month of pregnancy twelve were in the eighth or ninth month and nineteen were at or near term.

When the x ray diagnosis was checked up by cesarian section and with the clinical findings it was found to be reasonably accurate particularly after the seventh month of gestation and when the distance of the head from the upper margin of the bladder exceeded 1 cm. The method obviously was of no value when the fetus made a breech presentation.

GEORGE C. FINOLA, M.D.

Dorman H C and Sahyun P F. Identification and Significance of Spirochetes in the Placenta. Am J Obst & Gynec 1937 33 954

The finding of spirochetes in the placenta of 105 patients is recorded. In the 105 cases the average age of the patient was twenty seven and three tenths years the ages ranging from sixteen to fifty nine years. In 21 per cent of the patients the placenta examined was from the first pregnancy. Spirochetes can be found in the placenta of the syphilitic newborn in sufficient frequency to justify the search for them in suspicious cases. The search should be made after Levaditi infiltration in portions of the placenta which give an indication of the presence of spirochetes by the presence of pale yellow foci surrounded by dark granular peripheries.

In 391 pregnancies in 75 syphilitic mothers who were untreated and who presented spirochetes in the placenta of the last delivery an apparently healthy baby was produced in 3 of every 5 pregnancies. However the fact that the newborn baby appeared to be healthy did not indicate the absence of syphilis.

The successful termination of pregnancy after antisyphilitic treatment does not denote the absence of spirochetes from the placenta. The histopatho-

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Heitz-Boyer: Vertical Pyelography in One or Two Positions (*La pyélographie en verticale—verticale simple et double verticale*) *J d'urologie et chir*, 1937, 43 330

Heitz-Boyer reiterates the importance of his method of pyelography, presents a refined technique and, stresses the fact that he regards it of far more value than the extra effort which it requires, promises

For fifteen years he has used the vertical method of pyelography together with the horizontal in pre-operative studies of pathological changes in the kidney, ureter, and bladder, and found his method particularly valuable in cases of hydronephrosis, ptosis of the kidney, ureteropelvic obstruction, ureteral angulation or compression, and ureterovesical obstruction. His technique requires a table upon which the patient may lie horizontally, in a vertical position with the feet down, or in a vertical position with the head down. A coarse metal net may be used between the patient and the x-ray film to demonstrate the movement of the viscera in the different positions. The table need not be a complicated one, but one primarily useful to the urologist, allowing facilities for the taking of roentgenograms in any position. The arrangement must be such as to allow the x-ray tube to be directly centered over the kidney area either above or behind the patient. Briefly, his procedure is to use either the intravenous or retrograde method, taking pictures with the patient first horizontal, then with the feet down, then with the head down. The ureteral catheters may be left in place for either of the last two positions. He insists, however, that the entire process be under the supervision of the radiologist, the urologist being essentially a technician to aid in the taking of the films.

The author illustrates by roentgenograms how non-existent changes can be shown by the three positions, as well as the way in which true pathology can be accentuated or minimized by the vertical positions. It is pointed out, also, that post-operative pyelography in the three positions is of much more value in the estimation of surgical results than pyelography in the horizontal alone.

JOHN MARTIN, M D

Prandi, D.. The Pyelo-Renal Reflux in Normal and Pathological Conditions (*Il reflusso pielo-renale in condizioni normali e patologiche*) *Sperimentale*, 1937, 91 72

As early as 1856 it was discovered that substances injected into the renal pelvis are capable of passing into the circulation. Fifty years later this fact became significant when it was found that certain contrast substances used for visualization of the renal pelvis proved to be highly detrimental to the patient because they had passed into the circulation.

In 1924 Hinman formulated for the first time the theory of the "pyelovenous reflux." This author maintained that fluid introduced into the renal pelvis is more or less rapidly passing into the veins by diffusion or, in certain cases, with the aid of macrophages. Since this time a large number of investigators became interested in this problem and several experiments were performed in the attempt to elucidate the mechanism of this phenomenon.

Prandi studied experimentally the various forms of pyelovenous reflux with solutions, bacterial suspensions in oil injected at ordinary pressures and in known quantities into the urethra. These studies were made under contralateral chromoscopic, histological, and bacteriological control. Also corrosion preparations were used. Rabbits were used as experimental animals. The experiments were performed with normal, hydronephrotic, and pyonephrotic kidneys as well as with denervated and compensating kidneys.

On the basis of these experiments the author found that in normal as well as pathological kidneys there may occur a reflux of the contents of the renal pelvis into the renal veins. This reflux is not only observed with ordinary solutions, but it occurs also with suspensions and with substances of reduced fluidity such as oils. This reflux was also found to occur at a pressure less than the secretory pressure of urine, which is 60 mm Hg according to Cohnheim.

There are two main pathways by which this reflux occurs: the first involves the opening of the fornix, or papillocaecal angle, which acts as a safety valve; the other occurs through absorption of the tubular epithelium or through a rupture of the wall of the renal tubule.

In this process the macrophages participate actively. Absorption may also occur directly through the renal pelvis or through the ureter.

Pathological conditions may either retard or enhance reflux action. If the renal pelvis, for instance, is in a highly tonic state as it is found to be in hydronephrosis, the reflux is at first greatly enhanced, but as the condition progresses the opening of the fornix is anatomically altered and the tubular absorption is retarded.

Denervation of the kidney leads to a type of reflux as it is found in hydronephrosis probably due to changes of the renal circulation. If the kidney is in a compensating stage there occur as the result of it anatomical changes such as enlargement of the papillary crests which greatly favor the pyelovenous reflux.

In the pyonephroses the pyelovenous reflux may be retarded or enhanced according to the kidney's response to the inflammatory stimulus.

The author stresses especially the importance of two factors which are vitally concerned with this process.

congenital heart lesions. Rheumatic heart disease accounts for about 90 per cent of the cases.

Only 41 per cent of the group of 418 patients gave no history of rheumatic fever, scarlet fever, chorea or frequent sore throat. About 50 per cent were wholly unaware at the time they first consulted a physician in their pregnancy of the existence of a cardiac disease.

Hospitalization and complete rest are the greatest aids in the treatment of heart disease in pregnant women. Digitalis and its compounds are of definite help in the severe types of the disease. Increased pulse and respiration rates, dyspnea and cyanosis, undue fatigue, palpitation and chest pains are the outstanding signs and symptoms in the evaluation of the cardiac condition. The treatment in Class 1 and Class 2a cardiac patients consists of hospitalization two weeks before term, followed by spontaneous delivery or in a small number, forceps delivery at the beginning of the second stage. The severe types, Class 2b and Class 3, must be hospitalized earlier in the pregnancy in order to decide whether the pregnancy should be allowed to continue and if it is permitted to continue, delivery should be effected by forceps unless the patient is in the Class 3 category. In those patients who have had a definite break in compensation, it is advisable after adequate hospitalization with digitalis therapy to perform a cesarean section either at viability or at term and follow it with sterilization. (CHARLES BARON, M.D.)

LABOR AND ITS COMPLICATIONS

Foederl V. The Use of Evipan Sodium for Narcosis, Intoxication, and Twilight Sleep in Obstetrics and Gynecology. (Die Anwendung des Evipan Natrium fuer Narkose, Rausch und Daemmerschlaf in der Geburtshilfe und Gynaekologie). *Arch f Gynaek* 1936 163 123.

This article is based upon the experience in 3,000 cases of evipan narcosis in gynecology and about 500 cases in obstetrics. Contrary to the generally accepted view, evipan sodium is considered as a prototype of a regulating injection narcotic as with

the needle in a stationary position the dose can be adjusted according to individual and operative requirement. The idea of evipan intoxication is contrasted with the idea of evipan narcosis. To attain evipan intoxication in a body from 155 cm to 175 cm long, a rapid injection of from 4 to 6 c cm evipan is made at 1 c cm per second. In cases of anemic women and those with weak underdeveloped muscles, the dose is reduced 10 per cent, while in cases of athletic, plethoric women, the dose is increased 10 per cent.

A description of the twilight sleep is then given. After the effect of 0.5 c cm of thymophysin is produced from 3 to 5 c cm of evipan sodium according to need are given slowly in the fifteen to twenty minute period before the expected birth, 1 c cm in thirty seconds to induce sleep. If there should be a delay in the delivery, an additional injection of 2 c cm is given. By this method one can dispense with forceps, hand manipulation and extraction. A prolonged twilight sleep lasting as long as six hours is brought about with the rapid administration of 2 c cm in the veins in the middle of the initial period. At the same time, another injection of 8 c cm in the muscles is given in a radiating manner in the extensor surface of the thigh. In case the twilight sleep is weakened within the six hour period, it will suffice if the infiltrated muscle is lightly massaged as through quicker absorption a deeper sleep is brought on. To counteract the delivery pain, 2 c cm additional are injected in the veins. If the delivery should last longer than six hours, another injection of 10 c cm can be safely given in the muscles. In the last 130 deliveries there was not one single failure in the sense of an incomplete memory defect. There were pronounced signs of irritation with motor restlessness in 6 per cent of the cases. No ill effects were noted either in the mother or in the child. The period of delivery was shortened by one and one half hours in cases of primipara and by one half hour in cases of multipara. Failures on account of resistance to evipan amounted to 4 per cent.

(FRANKEN) CLARENCE C. REED, M.D.

It could hardly be suspected. The renal papilla, on the other hand, is quite the reverse, it is a delicate and complicated structure, subject to recognized morbid changes. It has been studied but little, and its pathology is still unwritten. Therefore, a second postulate was made: the initiating lesion was to be looked for on the renal papilla.

Of 298 pairs of kidneys examined, 28 showed a macroscopic lesion of the renal papilla heretofore unrecognized. The lesion consisted of the deposit of calcium in the walls of the renal papilla, 11 cases showed bilateral, and 4 unilateral, lesions. In 8 instances true stone was found in the act of crystallizing upon such a calcium plaque, and was still firmly adherent to it. Multiple variations of this picture were observed. By microscopic section and specific staining, it was proved that the observed plaques were composed of calcium.

The author demonstrated the relationship between such calcium deposits in the wall of a papilla and subsequent stone formation. Five phases of stone development were observed. Two clinical findings were made repeatedly: (1) the smallest shadows of renal calculi were frequently found in the position of the minor calyces and were often multiple in a given kidney, (2) small calculi, especially those passed rapidly, or promptly removed, even though the greater part of their surface was highly crystalline, almost always had one surface which was smooth, slightly depressed, and distinctly different from the remainder. This surface suggested that it may have been a point of mural attachment. Microscopic sections through the plaques of calcium in the walls of the renal papilla showed that the first deposit was regularly within the papilla and not on its surface. The primary calcium deposit was definitely below the surface, and non-inflammatory. It appears that the calcium plaque increased in size, the covering epithelium lost its support and nutrition, and the plaque was denuded gradually of the epithelial tissue covering it. In one section, a papilla had a very definite plaque, and upon it a tiny black speck. There was a characteristic calcium plaque, with the epithelium ending abruptly at either end, which was bathed in calyceal urine and was a secondary deposit. The authors consider this the earliest observation of a renal calculus formation, a secondary and apparently a different salt deposit on the early lesion. Another kidney specimen showed 3 papillae with the simple calcium deposit, but on a fourth papilla was a characteristic crystalline calculus growing directly upon a calcium plaque. This calculus was about 2 by 3 mm in size, of brownish tint, and firmly attached. Special staining methods showed the stone to be of calcium phosphate, the plaque, while taking a stain specific for calcium, was not of calcium phosphate. This observation showed both grossly and microscopically, a true stone arising from a characteristic calcium plaque, and the growth of a stone of one chemical character upon a basement plaque of a different chemical make-up. The commonly understood infectious process was never seen. The facet,

seen on small calculi if apparently of short duration in their clinical passage or removal, is not only smooth, but also sunken below the surface, with the crystalline periphery as a raised edge around it. Sections near the edge show not only the undermining edge of the plaque, but that the edge appears actually lifted from its tissue base. The authors believe that when the calculus leaves its birthplace and papillary attachment, it does so by first loosening the plaque and then tearing it out from its tissue bed, the plaque goes away with the stone.

The cause of the calcium deposit can be explained by a reparative effort of the body following cell damage and degeneration. What causes the damage is still unexplained, and the rôle played by the various processes which have been closely related heretofore to stone formation awaits further investigation. The chemical character of the salt to be deposited may be any one of the urinary salts found in urinary stone formations. The physical and chemical make-up of the calyceal urine determines the character of the salt that will crystallize and form the stone. This make-up may be the same throughout, or may vary in given periods of time which factor causes the lamination of stones, or it may be constantly mixed with one salt in greater proportion.

LOUIS NEUWELT, M.D.

Nicolai, E: Recurrences After Operations for Renal and Ureteral Calculi (Rezidive nach Nieren- und Harnleitersteinoperationen) 1936 Leipzig, Dissertation.

The frequent recurrence of stone formation after operative removal of renal calculi with retention of the kidney is a warning not only to remove the stone, but also to treat the calculous kidney after the operation. Cabot, in 1915, was the first to demonstrate the frequency of calculous recurrence, he found recurrence in 50 per cent of his cases which were operated. According to Chwalla, freedom from recurrence of a calculus, naturally, only in the kidney operated upon, can be ascertained only after six years, even though the recurrences usually occur in an average of two years. True and false recurrences must be differentiated, the latter develop from remains of stones not removed at the time of the operation, which are demonstrable if a controlling roentgenogram is made immediately after the operation for stone. While the avoidance of false recurrences is largely in the hands of the surgeon, he cannot control the true recurrences, as we do not definitely know the causal genesis of stones.

The author then presents in detail a very instructive review of the numerous widely varying conceptions of the origin of urinary calculi, which should be read in the original. The uric-acid stones show a much higher percentage of recurrence than the oxalate stones, 13.5-70 per cent, according to Hellstroem.

The operative intervention produces conceivable injuries, which favor a new formation of stones;

(1) The configuration of the papillorenal angle. If the angle is acute the reflux is enhanced but if the angle is obtuse there is a greater tendency toward a tubular absorption.

(2) Physical properties of the liquid present in the renal pelvis. The reflux is enhanced in cases of a ruptured fornix with substances of low fluidity or with substances whose specific gravity nearly equals that of urine. Bacterial suspensions as a rule are absorbed very easily and rapidly.

RICHARD E. SOMMA, M.D.

Wingazzini E. The Surgical Cure of Nephritis and Nephrosis (La cura chirurgica delle nefriti e delle nefrosi) *Arch ital di chir* 1937 45 533

The following operations are at the disposal of the surgeon in the surgical treatment of nephritis and nephrosis: nephrectomy, nephrotomy, nephrolysis, capsulectomy, renal enervation, periaarterial sympathectomy, periaarterial application of 5 per cent phenol to interrupt the sympathetic fibers, paravertebral (sympathetic ganglion) injection of a neurolytic solution consisting of alcohol, stovain and phenol from the tenth dorsal to the first lumbar vertebra, and section of the rami communicantes of the eleventh dorsal and first two lumbar spinal nerves.

The surgical risk of nephrectomy and nephrotomy is too high. Nephrolysis is indicated in painful conditions. Capsulectomy appears to be the operation of choice. Periaarterial sympathectomy is too dangerous. The author's experiences with paravertebral injections and section of the rami communicantes have been too limited to arrive at definite conclusions.

DAVID IMPASTATO, M.D.

Marini A. Bilateral Renal Tuberculosis (Sulla tuberculosis renale bilaterale) *Arch ital di urol* 1937 14 187

The author gives a report of the cases of bilateral renal tuberculosis at the *Uffreduzzi's clinic* at the University of Turin from 1933 to 1936. Of fifty-one cases of renal tuberculosis admitted during this period sixteen were bilateral. Ten of these were operable, the others were inoperable either because of the advanced stage of the kidney lesions or the accompanying pulmonary tuberculosis. Three of the patients who were operated upon died in less than three months with progressive lesions in the remaining kidney and miliary tuberculosis. The late results in the remaining cases were satisfactory.

Marini concludes that bilateral tuberculosis of the kidney is much more frequent than is supposed. As to operability these patients were divided into three classes: (1) those in which one kidney was gravely affected while the other although containing early lesions was functioning fairly well; (2) those in which both kidneys contained early lesions but had retained a considerable degree of function in which both participated actively; (3) those in which both kidneys were severely although unequally affected and both were secreting imperfectly and the total

function was insufficient. The cases in the first and second groups were operable; those in the third were not. Even though the renal lesions may be early, operation was contra-indicated in the presence of tuberculosis of a certain grade in other organs, especially the lungs. Early lesions in other locations, however, were helped by removal of the tuberculous kidney. Nevertheless in bone tuberculosis great caution is necessary, as a supposedly healed focus may be lighted up again. Tuberculosis of the genital tract, especially of the epididymis, the seminal vesicles and the prostate, does not make the prognosis of nephrectomy worse.

M. E. MORSE, M.D.

Marion G. Sand in the Kidney Pelvis or Ureter (De l'ensablement du bassin et du de l'uretère) *J urol mé d et chir*, 1937 43 297

The descriptive term ensablement, sand deposit or sand bank is illustrated by five brief case histories of patients who suffered symptoms of renal colic or anuria on account of blockage of the ureters or kidney pelvis. The author points out that lavage of the blocked ureter and pelvis with a ureteral catheter though not always a simple procedure may often bring about sudden and complete relief by washing out sand and gravel like deposits such as frequently tend to form after a patient has had a major operation and has received an insufficient quantity of fluids. Lavage is particularly worthy of trial when the patient already has but one kidney. Open operation with the removal of a true calculus is advised when medical treatment such as one receives at a spa has not succeeded in dissolution of the calculus or when the deposit of sand cannot be moved by lavage. In all cases of anuria which may conceivably be due to a blockage of the ureter or renal pelvis by sand deposits, ureteral catheterization should be the immediate treatment.

Too much dependence upon x-ray diagnosis of this condition is discouraged because as is commonly known even formed calculi do not show in the x-ray picture at times and much less sand deposits of urates, phosphates or oxalates.

JOHN MARTIN, M.D.

Randall A. and Melvin P. D. The Morphogeny of Renal Calculus. *J Urol* 1937 37 755

None of today's theories of the cause of renal calculi such as infection, urinary stasis and obstruction, parathyroid hyperactivity, Vitamin A deficiency and disturbed colloid chemistry are entirely acceptable and the author creates the primary postulate that there must be an initiating lesion which precedes the formation of a renal calculus. Experimental researches in an effort to prove this postulate by making an initial lesion were ineffectual. A second postulate was necessary as to where such a lesion might be expected to be found. The renal pelvis is an uncomplicated structure lined by several layers of polygonal cells and with a surface layer of large flat epithelial cells; it is resistant to insults and performs a simple physiological duty.

cause stone formation. Labile colloids tend to precipitate and may be the nucleus for stones. Hippuric acid can stabilize certain labile colloids, and thereby may prevent stone formation. The stable colloids may also help to keep certain insoluble salts in solution. Therefore, too little of a stable colloid or too much of a labile colloid may favor stone formation. An excess of crystalloids in the urine may also cause stone formation, sometimes as a result of a metabolic disturbance, as in gout and cystinuria. Recently, the increased urinary excretion of calcium and phosphorus in hyperparathyroidism and the associated high incidence of stones containing large amounts of calcium and phosphate have been reported. Increased urinary excretion of crystalloids may also result in normal individuals from increased ingestion of substances sparingly soluble in the urine. Some people take large amounts of foods containing calcium phosphate, such as milk, which predispose to phosphate stones. Large amounts of alkali induce the precipitation of calcium phosphate. Alkaline urine may result from eating vegetables with a high alkali ash residue, or fruits in excess. The Sippy diet for gastric or duodenal ulcer contains large amounts of alkali and high calcium and phosphate diets, and results in phosphaturia and calcinuria and the precipitation of calcium phosphate and calcium carbonate. Food containing large amounts of oxalates may cause oxalate stones.

The chemical analysis of the calculus is important in establishing its cause. It shows what constituents are to be restricted in the diet and whether an acid or alkali regime is indicated. The presence of cystin or uric acid points to cystinuria or gout. Large amounts of calcium oxalate in a stone suggests hyperoxaluria; stones of phosphates suggest hyperparathyroidism and other conditions associated with an increased urinary excretion of calcium and phosphorus. Phosphate stones occur also in urinary infections with a persistently alkaline urine. Carbonates also suggest factors leading to alkaline urine.

In the presence of a calculus containing a large amount of phosphates, the presence or absence of hyperparathyroidism must first be determined by the determination of the serum calcium and inorganic phosphorus levels, and the urinary calcium excretion. A rough estimate of the amount of calcium in the urine may be made rapidly by the following method devised by Sulkowitch:

Five c cm. of an oxalate buffer mixture composed 2.5 gm. of oxalic acid, 2.5 gm. of ammonium oxalate, and 5 c cm. of glacial acetic acid dissolved in distilled water and made up to a volume of 150 c cm. are added to an equal amount of urine, which is acid, or has been made acid with strong acetic acid, in a test tube and shaken. The turbidity is observed in two minutes. In hyperparathyroidism there will be much turbidity, while with a normal amount of calcium excretion there will be less turbidity. In marked calcinuria a dense cloud is observed immediately. The patient should be on a diet free from milk or acidifying agents.

If hyperparathyroidism can be excluded, two other conditions must be considered. The first is increased urinary excretion of calcium and phosphorus of metabolic origin, as in bone atrophy from disuse, especially that associated with long recumbency, as in fractures, fusions of the spine and hips, and poliomyelitis. In this condition stasis and interference with drainage are contributory factors. Stones are also found in Cushing's syndrome. Another condition is that in which the diet contains excessive calcium phosphate, such as milk. Large amounts of phosphate are also found with a persistently alkaline urine as in people who ingest large amounts of alkalies for minor gastric disturbances and headaches, and much fruit. Another cause for persistently alkaline urine and phosphate stones is infection of the urinary tract with urea-splitting organisms, such as the bacillus proteus. In some cases of phosphatic calculi, the cause is unknown.

Calculi may consist of one or a mixture of salts. Persistently alkaline urine leads to the precipitation of phosphates and carbonates. The cause of calcium-oxalate stones is unknown, but in certain cases there may be an increased endogenous urinary oxalate excretion from increased ingestion of oxalates or as a result of inspissated urine. Uric-acid stones are found in gout, in cases of which a serum uric-acid test should be done and other signs of gout sought. Cystinuria is a familial condition with cystin stone formation and of unknown cause. The diagnosis is made by finding the hexagonal cystin crystals in the acid or acidified urine.

Usually fluids are forced for two reasons: to decrease the chance for the collection of pus and debris; and to decrease the saturation of crystalloids in the urine and facilitate their absorption from the stone. The patient should never feel thirsty. The best guide is the urinary output. In the presence of badly-infected urines and poor renal function fluids should be forced up to 4 or 5 liters per day. It has not been shown that the restriction of fluids produces a more acid urine than a highly dilute one. Theoretically, an increased urinary output might lead to a more acid urine. When a urinary antiseptic, such as mandelic acid, or a ketogenic diet is given, fluids should be restricted.

In the presence of phosphate stones due to hyperparathyroidism, the latter should be treated. The treatment of patients with predominantly phosphate or carbonate stones of other cause is directed toward the solution or prevention of precipitation of the phosphates and carbonates. The more acid the urine, the more readily this end is achieved. The urine should be kept as acid as possible, with a pH of from 4.8 to 5.5, with an acid-ash diet and an acidifying salt by mouth. The acidity should be controlled as otherwise harm may result. Chlorophenol red paper retains its yellow color when the pH is less than 5.5, and turns red if the pH is above this point. Nitrazine paper undergoes a variety of color changes, which permit determination of the pH from 4.5 to 7.5. Sodium acid phosphate is

nephrotomy is followed by a considerably higher percentage of recurrences than pyelotomy. In order to avoid a recurrence after a conservative operation the indication for the operation is greatly limited by some authors and a spontaneous passage of the stone is awaited as long as possible. On the other hand operation in the aseptie period by pyelotomy is the procedure of choice as the additional infection makes the renal injury worse because of the increase in size of the stone and in the presence of an existing infection operation is absolutely necessary.

A limitation of the surgical intervention is indicated in patients who chronically excrete urate stones who spontaneously rid themselves of small stones and similarly the operation should be postponed in children up to the end of the stone forming period in puberty (Boshamer). Further more recurrences of so called neurotic stones in tabes and injuries of the spinal cord are very common so that operation should be done only in the most urgent cases. Individual surgeons always follow the lithotomy with a nephropexy so as to avoid stasis of the urine by descent of the kidney or kinking of the ureter. Some authors greatly prefer to avoid the operation for recurrence except for a false recurrent stone found roentgenologically immediately after the operation because of the difficulty of the intervention as a result of adhesions they prefer to await spontaneous passage of the stone.

The author then reports on 185 cases of stones removed during ten years at the Leipzig Clinic. The considerable increase in urinary stones since 1924 is demonstrable from a graph. The number of men operated upon with retention of the kidney is double that of women in 12 cases the condition was bilateral but in only one were both sides operated upon. There were 112 pyelotomies, 28 nephrotomies and 41 ureterotomies. suprapubic section was done 3 times for intramural stones. In the pyelotomies anterior section of the renal pelvis was always done the nephrotomies were made on the convexity of the kidney and palpation was done through the pelvis and calyces. Of these 185 patients later detailed information was obtainable in 129. Death occurred in 9 cases of the calculous disease from uremia or postoperative complications arose in 5 pneumonia or embolism and in 9 cases as a result of diseases having no causative relationship to the condition. Of the 121 surviving patients 40 had no symptoms and 14 considered them as slight. In 54 of the patients who were examined the possibility of a new stone formation could be determined. An unquestionable recurrence was found in 14 patients and the spontaneous passage of a stone from the kidney previously operated upon was observed in 5 others but they were then free from stone. The author estimates the number of recurrences after conservative operation as 32 per cent. The histories of these 19 cases are reported in detail.

After 81 pyelotomies the ultimate results of which could be controlled a recurrence of stones was observed in 6 (7.6 per cent) of the patients after 19 nephrotomies in 6 (31.6 per cent) of the patients and after 6 ureterotomies in 2 (7.7 per cent) of the patients. The tendency toward recurrence was especially marked in bilateral cases and was found in 25 per cent of the cases. Chronic urate stones show a great tendency to recur, therefore in patients with this type of stones operation should be restricted as much as possible.

(JANSEN) LOOS, NEUWELT M D

Barney J D and Sulkowitch H W. Progress in the Management of Urinary Calculi. *J. Urol.* 1937 37 746

Dietary and hygienic conditions are important factors in stone formation. Inadequate or scanty food supplies raise the incidence of stone. The prolonged lack of sufficient fat soluble Vitamin A in the diet is an important factor in the production of phosphatic calculi. It has also been shown that the keratinizing effect on the epithelium of the urinary tract is produced by the lack of Vitamin A in the diet. This keratinized epithelium may serve as the nucleus for urinary stones. Higgins claims that all of the stones invariably dissolve and disappear on the administration of either a high Vitamin A acid ash or a high Vitamin A alkaline ash diet if the pH of the urine is carefully and frequently checked and regulated but this claim has been denied by others. The literature contains innumerable references to the rôle of infection in the formation of stone. Many believe that other factors such as a disturbed metabolism and faulty drainage are of equal importance and that a combination of all or some of the factors is necessary for the production of stones. Rosenow and Meisser claim that certain bacteria especially streptococci have a special affinity for the urinary tract. Hager and Magath have shown that certain stones form in the presence of a gram negative organism capable of breaking up urea into carbon dioxide and ammonia namely the bacillus proteus. Urinary stasis has also been claimed to be a factor but infection is often coexistent with stasis and it is impossible to separate cause and effect. Inadequacies of renal drainage resulting from prolonged recumbent posture as in bed fast patients especially those with fractures and with poliomyelitis not infrequently lead to stone formation. This is due not alone to the inadequate urinary drainage but to the increased excretion of calcium and phosphorus in the urine which accompanies the bone atrophy of disuse. Some substances that are practically insoluble in aqueous solutions can easily be dissolved upon the addition of so called hydrotropic substances such as sodium benzoate sodium salicylate sodium hippurate urea and mandelic acid. Upon the addition of these substances to the drinking water the solubility of calcium oxalate and calcium carbonate is greatly increased. The absence of sufficient hydrotropic substances in the urine may

neal prostatectomy was rightfully adhered to even after the instrument of Heywaldt became available. This instrument consists of a small knife by means of which small grooves are burned into the prostate, the necrotic areas were allowed to slough off spontaneously. The period of treatment was therefore quite prolonged. Very often incrustated shreds had to be removed by means of an instrument. All this has been changed since the wire-loop instrument has been employed. With the loop large numbers of sections, from 3 to 4 cm long and from 3 to 4 cm thick, can be excised from the prostate. The least amount of prostatic tissue which can be removed at a single coagulation is approximately one-half of a test-glass full. The severed portions of prostatic tissue are withdrawn after each incision. Even if some shreds remain in the bladder, they can be washed out easily, encrustation of the fragments does not occur as in the cases in which the Heywaldt instrument is used. The operation is performed without anesthesia, only the bladder mucosa is anesthetized locally with pantocain.

The results of this form of treatment have been vastly improved since the introduction of the wire-loop method. About 92 per cent of patients with prostatic hypertrophy can be treated by either of these two coagulation methods. No deaths resulted from the treatment of 200 patients by these means. Following coagulation with the cutting instrument 47 per cent of the patients had no more residual urine, with the new instrument, 87 per cent had no residual urine. Residual urine up to 50 c cm was found in 24 per cent of the patients treated by the old method, this amount of residual urine was noted in only 5 per cent of the patients treated by the loop method. Residual urine of more than 50 c cm was noted following the old method in 21 per cent of the cases, and after the new method in only 2 per cent. In the course of treatment by both methods from 3 to 5 per cent of the patients died. The average duration of treatment fell from nine to ten weeks to six weeks. One hundred and seventy-nine cases of prostatic hypertrophy, which had been treated by electrocoagulation, were carefully investigated for this report. All these patients had a residual urine ranging from more than 50 c cm to complete retention, all were treated for at least eight days by retention catheter and bladder irrigations, only those who had urinary retention of over 50 c cm despite these treatments were subjected to electrocoagulation. The residual urine was thus carefully standardized before the operation. Because of poor general health 9 of the 179 patients were not subjected to the coagulation treatment. Nine patients were more than eighty years of age, 85 were between sixty and seventy years, and 47 were between seventy and eighty years. These are ages at which prostatectomy is possible only under extremely favorable circumstances.

In spite of these apparent advantages numerous objections have been raised against the coagulation method. Mention has been made of the danger of

perforating the bladder with the coagulation instrument. Experience has shown, however, that this danger is no greater than after ordinary cystoscopy. Moreover, an accident of this type has never been known to have occurred. It has also been stated that carcinoma of the prostate might easily be overlooked by this method. This is possible. In fact, however, through regular histological examination of the excised particles, prostatic cancers were discovered repeatedly, in only a few cases would prostatectomy have been possible on account of the general condition of the patient. At all events, electrocoagulation was the sole means of relieving the symptoms. It is well known that there are certain forms of prostatic hypertrophy which, because of the size and position of the prostate, give rise to ureteral compression. These cases are rare and are usually associated with such a poor general condition of the patient that no surgical operation can be performed. This is shown by roentgenograms. In these cases the results of electrocoagulation alone must be satisfactory. The former method of electrocoagulation required a period of treatment of from ten to twelve weeks, the period of treatment has now been shortened to six weeks. The time required, therefore, does not indicate recourse to the surgical method. Secondary hemorrhage of a serious nature was noted only two or three times in a series of 200 patients with 600 coagulations. Epididymitis and orchitis are noted no more frequently than following other methods. Prostatic abscesses have never been noted. Trauma of the vesical sphincter results in urinary incontinence which is quickly relieved. Recurrences are encountered. About 12 of the 200 patients treated during the past four years required additional coagulations. As compared to the dangers of transvesical or perineal prostatectomy, these recurrences need not be considered a drawback to the method since recurrences are noted after prostatectomy also. In the Magnus Clinic the surgical operation is now performed only for prostatic carcinoma and in cases in which a very large prostate causes ureteral displacement, provided that the general condition of the patient permits.

HAROLD C. MACE, M.D.

Henningsen, O.: Results of Treatment of Subvesical Adenoma, So-called Prostatic Hypertrophy. A Critical Study on the Basis of Follow-Up Examination of 384 Patients (*Behandlungsergebnisse des subvesicalen Adenoms, der sogenannten Prostatahypertrophie. Eine kritische Studie an Hand von 384 nachuntersuchten Kranken*). *Beitr. z. klin. Chir.*, 1936, 164: 444.

The author critically evaluates the results of the two-stage operation on the prostate at the clinic at Giessen, after three years. Of the 457 patients which were treated and examined, 384 (83.8 per cent) were re-examined. The greatest number of one-stage operations were performed in the years up to 1931. 111 one-stage operations as against 13 two-stage operations. Since that time the two-stage

widely used to increase urinary acidity but it has the disadvantage of increasing the phosphate concentration in the urine and thus inhibiting the solution of the phosphate in the stone. Ammonium chloride is the acidifying agent of choice.

An acid regime is contra indicated in patients with an impaired kidney function as manifested by a high chloride level and a low carbon-dioxide combining power of the plasma. The most important contra indication for acid therapy is infection with urea-splitting organisms such as the bacillus proteus and certain streptococci and staphylococci. In cases of peptic ulcers this regime may have to be modified. It is also harmful in patients with cystine and uric acid calculi because of the insolubility of the latter in acid solutions. In calcium-oxalate calculosis acid therapy may also do harm. Uric acid stones are treated by restricting the purin intake and with the administration of alkalis by mouth. For cystine stones the treatment is directed toward the maintenance of an alkaline urine and a reduction of the protein in the diet.

In the hyperparathyroid group no increase in size of the existing stones or recurrence was observed following parathyroidectomy. In the treatment of phosphate and carbonate stones the use of an acid ash diet and acidifying agents by mouth has been found satisfactory except when impaired renal function or infection with urea-splitting organisms was present.

In bacillus coli infections with a pH of 5.5 or less in the urine mandelic acid is very efficacious in clearing up infection. It is valuable in alkaline urine. The urine is first acidified with an acid ash diet and ammonium chloride by mouth. Then some preparation of mandelic acid, sodium or ammonium mandelate is given daily in doses equivalent to 12 gm of mandelic acid. Fluids must be restricted but acidosis must be avoided. No peptic known for infections with urea-splitting organisms.

In the presence of recurrent stones after operations it is important to determine whether the recurrences are true new stones or stones that have been left behind at the time of operation. For such a determination the use of renal fluoroscopy on the operating table has been recommended by Braasch and Carman. Because of the drawbacks and difficulties of this procedure Quinby suggested making a film of the kidney on the operating table. Partial nephrotomy with avoidance of the large blood vessels of the kidney in the removal of the stones constitutes conservative surgery. The importance of cortical as well as pelvic drainage after pyelotomy or nephrotomy especially when extensive and severe infection is present is recognized. In stones caused by hyperparathyroidism it is better to remove the parathyroid tumor before removing the stone if the stone causes no obstruction nor acute symptoms.

In the study of urinary calculi the cooperation of the internist, the clinical chemist and the bacteriologist is absolutely necessary.

LOUIS NEUWEEL, M.D.

BLADDER URETHRA AND PENIS

Balderi G. Partial Gangrene of the Bladder and Posterior Urethra (Gangrena parziale della vescica e dell'uretra posteriore). *Arch ital di urol* 1935; 14: 345.

The present case is reported first, because it presents a new complication of chronic prostatitis of the diverticular type, and second because it shows a number of inflammatory and destructive lesions of the posterior urethra and vesical neck which are especially interesting on account of their unusual character. It is an example of the group of pathological processes which localized for a time in the posterior urethra constitute later a starting point for various distant and general complications. This group has already assumed such importance as to form a separate chapter in urological pathology. The primary agent in almost all these cases is the gonococcus.

The patient, forty-five years old, had a stricture as the result of gonorrhea at eighteen years. At forty-four years of age he began to have dysuria, frequency, terminal hematuria, and a purulent urethral discharge. The urine contained streptococci, staphylococci and gonococci. The prostate was somewhat enlarged and painful. The urethrogram showed numerous small irregularities in profile. The posterior urethra had the form of a cone with its base at the enormously dilated neck of the bladder and its apex at the bulb.

The patient left the clinic against advice and returned eight months later in a much worse condition. The urine was fetid. Rectal examination gave signs of purulent collections in the prostate. The temperature remained normal. Urethrocytography showed an enormous dilatation of the posterior urethra including the neck, and especially of the inferior wall. The patient died suddenly before cystotomy was performed.

Autopsy revealed a fibrinopurulent streptococcal peritonitis. The posterior urethra, prostate neck of the bladder and trigone were converted into a single huge cavity with necrotic walls. Only a thin shell of prostatic tissue remained. There was also a hemorrhagic cystitis and a pericystitis. The testes, ureters and kidneys were not unusual in appearance.

Evidently, the permanganate irrigations used by the patient on his own initiative had acted as a causative factor in producing the gangrene.

Balderi gives a general discussion of gangrene of the bladder with a bibliography, urethrocytograms and photographs. M. E. MORSE, M.D.

GENITAL ORGANS

Schoercher F. The Treatment of Prostatic Hypertrophy by Means of Electrocoagulation (Die Behandlung der Prostatahypertrophie mittels Elektrokoagulation). *61 Tag d. deutsch. Ges. f. Chir.* Berlin 1937.

The treatment of prostatic hypertrophy in the past was mainly surgical. The transurethral or peri-

neal prostatectomy was rightfully adhered to even after the instrument of Heywaldt became available. This instrument consists of a small knife by means of which small grooves are burned into the prostate, the necrotic areas were allowed to slough off spontaneously. The period of treatment was therefore quite prolonged. Very often incrustated shreds had to be removed by means of an instrument. All this has been changed since the wire-loop instrument has been employed. With the loop large numbers of sections, from 3 to 4 cm long and from 3 to 4 cm thick, can be excised from the prostate. The least amount of prostatic tissue which can be removed at a single coagulation is approximately one-half of a test-glass full. The severed portions of prostatic tissue are withdrawn after each incision. Even if some shreds remain in the bladder, they can be washed out easily, encrustation of the fragments does not occur as in the cases in which the Heywaldt instrument is used. The operation is performed without anesthesia, only the bladder mucosa is anesthetized locally with pantocain.

The results of this form of treatment have been vastly improved since the introduction of the wire-loop method. About 92 per cent of patients with prostatic hypertrophy can be treated by either of these two coagulation methods. No deaths resulted from the treatment of 200 patients by these means. Following coagulation with the cutting instrument 47 per cent of the patients had no more residual urine, with the new instrument, 87 per cent had no residual urine. Residual urine up to 50 c cm was found in 24 per cent of the patients treated by the old method; this amount of residual urine was noted in only 5 per cent of the patients treated by the loop method. Residual urine of more than 50 c cm was noted following the old method in 21 per cent of the cases, and after the new method in only 2 per cent. In the course of treatment by both methods from 3 to 5 per cent of the patients died. The average duration of treatment fell from nine to ten weeks to six weeks. One hundred and seventy-nine cases of prostatic hypertrophy, which had been treated by electrocoagulation, were carefully investigated for this report. All these patients had a residual urine ranging from more than 50 c cm to complete retention, all were treated for at least eight days by retention catheter and bladder irrigations, only those who had urinary retention of over 50 c cm despite these treatments were subjected to electrocoagulation. The residual urine was thus carefully standardized before the operation. Because of poor general health 9 of the 179 patients were not subjected to the coagulation treatment. Nine patients were more than eighty years of age, 85 were between sixty and seventy years, and 47 were between seventy and eighty years. These are ages at which prostatectomy is possible only under extremely favorable circumstances.

In spite of these apparent advantages numerous objections have been raised against the coagulation method. Mention has been made of the danger of

perforating the bladder with the coagulation instrument. Experience has shown, however, that this danger is no greater than after ordinary cystoscopy. Moreover, an accident of this type has never been known to have occurred. It has also been stated that carcinoma of the prostate might easily be overlooked by this method. This is possible. In fact, however, through regular histological examination of the excised particles, prostatic cancers were discovered repeatedly; in only a few cases would prostatectomy have been possible on account of the general condition of the patient. At all events, electrocoagulation was the sole means of relieving the symptoms. It is well known that there are certain forms of prostatic hypertrophy which, because of the size and position of the prostate, give rise to ureteral compression. These cases are rare and are usually associated with such a poor general condition of the patient that no surgical operation can be performed. This is shown by roentgenograms. In these cases the results of electrocoagulation alone must be satisfactory. The former method of electrocoagulation required a period of treatment of from ten to twelve weeks, the period of treatment has now been shortened to six weeks. The time required, therefore, does not indicate recourse to the surgical method. Secondary hemorrhage of a serious nature was noted only two or three times in a series of 200 patients with 600 coagulations. Epididymitis and orchitis are noted no more frequently than following other methods. Prostatic abscesses have never been noted. Trauma of the vesical sphincter results in urinary incontinence which is quickly relieved. Recurrences are encountered. About 12 of the 200 patients treated during the past four years required additional coagulations. As compared to the dangers of transvesical or perineal prostatectomy, these recurrences need not be considered a drawback to the method since recurrences are noted after prostatectomy also. In the Magnus Clinic the surgical operation is now performed only for prostatic carcinoma and in cases in which a very large prostate causes ureteral displacement, provided that the general condition of the patient permits.

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The author critically evaluates the results of the two-stage operation on the prostate at the clinic at Giessen, after three years. Of the 457 patients which were treated and examined, 384 (83.8 per cent) were re-examined. The greatest number of one-stage operations were performed in the years up to 1931: 111 one-stage operations as against 13 two-stage operations. Since that time the two-stage

operation has been depended upon more and more as even a thorough course of treatment with the catheter does not provide the necessary decompression and prerequisites for the recuperation of the patient. Of 120 one stage operations performed on patients of an average age of 65.9 years, 75 were permanently successful (62.5 per cent). Forty seven of the patients are still alive and nearly all of them are free from symptoms. Forty five of 120 patients (37 per cent) died. Of the deaths 35 occurred immediately following the operation. Of 60 patients with a two stage operation 4 died uncured of these 3 died primarily. The remaining 56 patients who were relieved of their condition are now in a good condition. Since therefore the total mortality both primary and secondary following the one stage operation was 37 per cent and following the two stage operation only 6.6 per cent today practically only the two stage operation is done. In a series of 54 cases of prostatic conditions operated in two stages only three deaths occurred in the last three years. Prostatectomy is the ultimate aim in treatment but because of the number of neglected cases and patients who refuse operation that aim is far from attained. The estimation of operability is quite difficult. The numerous examining methods and functional tests should not be schematized and operative indications drawn solely therefrom. The most important object was adequate decompression and removal of the hindrance to urination which caused the diseased condition. One examination was not sufficient. Functional tests had to be made repeatedly at intervals. When the tests of function were good in the beginning and then became progressively worse operation was unconditionally contra-indicated. These tests showed in addition that the indwelling catheter in a large series of cases did not provide adequate decompression. The upper urinary passages were not benefited by relieving the pressure in the lower passages. A definitive judgment could be arrived at only when several of such examinations were instituted. An upper and lower limit to the Vahlhard test and to the residual nitrogen determinations could not be set and the results of several tests following one another gave the determination. The longer a large amount of residual urine was present, the more intensely ascending infection was found. Of 51 primary and secondary deaths 17 of the former and 7 of the latter (47 per cent) were ascribed to infection. Acute urinary retention played an especially important rôle in the severity and extent of the infection. Infection spread rapidly in the passages with retention of urine but did not keep pace in regression with the improvement in the kidney function upon relief of the compression. A correspondingly long time of preliminary catheter treatment was therefore necessary. In the two stage operation the first operation provided the best possible mobilization of the local and general resistive forces of the patient. Preliminary vasectomy offered in addition a hindrance to the

infection spreading to the epididymis and testicle. This operation did not produce any regression or even a halt in the growth of the adenoma itself. It represented however a functional test of the resistive powers and general reactivity of the body.

Of 57 patients with palliative operations 44 (77.2 per cent) were brought back for re-examination. Thirty seven had been subjected to high frequency coagulation by the endovesical route. The results at this period were discouraging as merely an apparent improvement of the condition had been attained. The growth of the para urethral glands was in no wise inhibited quite the opposite it seemed that the superficial cooking exerted a stimulus on the processes of growth. Of 11 patients only 1 was really cured. 2 of the remaining 10 were unable to get along without their catheter at all and the rest could get along without it only temporarily. All except 3 died of their ailment within three years. Of the last group of 18 patients 4 presented a carcinoma. In occasional cases in which the difficulty was a stenosis of the bladder neck or an isolated middle lobe a definitive cure was achieved. Coagulation could not be considered a substitute for the radical operation particularly as it is not entirely without the dangers of bleeding or post-operative abscess. An exact evaluation of the operation was impossible. Of 200 and four of 437 patients could not be operated on of these 160 (73.6 per cent) were brought back for re-examination. The ratio of the patients not operated upon to those who were treated surgically was 53 to 74. In the first group were placed the patients who had received a preliminary treatment with an indwelling catheter but voluntarily left the hospital without receiving further treatment. Forty three refused to be operated upon and of these 3 today are able to go without the catheter. 10 still have considerable residual urine and use the catheter occasionally and of the remaining 28 all but 11 have died while still undergoing permanent catheterization. The total figures wherein it is seen that of 43 patients there are only 3 living who have no symptoms from the prostate enlargement show the general poor prognosis of the condition and illustrate the great importance of early operative treatment. The danger of uremia may be controlled with the catheter not however, the ascending infection. The patients who were suffering from inadequacy of the upper urinary passages whose trouble was not relieved by catheter treatment presented an unconditional contra-indication to operation and could not be saved by any palliative or conservative methods. The only difficulty in these cases was their recognition. A second group was comprised of patients who recovered the power of spontaneous micturition and since then remained free from trouble. This condition occurred in 33 of 160 patients who were brought back for re-examination. Twenty four of these are today still alive and well without catheterization since they left the hospital. Therefore 20.6 per cent of all patients subjected to

catheter treatment, were cured by one or several catheterizations, without other treatment. The last group of 84 patients came to treatment in such a poor condition that active treatment was contra-indicated. Of these, 46 are still alive, all the others died within three and a half years. Sixty-seven died of their original bladder condition. Therefore, of the other patients using a permanent catheter, 63.8 per cent are dead.

In evaluating the results of treatment of prostatic hypertrophy importance is not attached so much to the momentary functional condition as to the course of the functional recovery in the urinary passages, in the kidney, in the circulatory system, and in the general condition of the patient, and this is what determines the prognosis and the operative indications. (HEMPEL) JOHN W. BRENNAN, M.D.

Davis, T. M.: The Technique of Prostate Resection
J. Urol., 1937, 37, 763

The author advocates the transurethral removal of the prostate gland, stating that less than 2 per cent of all cases are not adaptable to this procedure. He describes in detail the procedure he has developed and used in over 1,052 cases.

In all cases he emphasizes the need for transurethral prostatectomy and not the mere removal of the obstructing tissue.

For anesthesia, trans-sacral and caudal is his choice, as over-distention of the bladder is less apt to occur during the operation. Postoperative flatulence is decreased and liquids can be forced more promptly after the operation than when spinal anesthesia is employed.

At the time the resection is to be performed, careful study of the bladder and vesical neck should be made with the right-angle vision telescope and the retrograde telescope for the purpose of determining the type of obstruction and the location of the ureters.

In cases presenting a median bar, he advocates control of the blood supply by cutting and coagulating the vessels at the sulci before complete excision is made.

In cases of large median and lateral lobes, he removes the median and then the lateral lobes, whereas when the lateral lobes are large and the median is small, the reverse procedure is advisable.

Massive coagulation is now thought inadvisable, but coagulation at the active bleeding points is advocated.

After the operation is completed, the blood pressure of the patient is raised to within 20 mm. of the pre-operative pressure. The removal of calculi is carried out after the resection.

J. SYDNEY RITTER, M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

CONDITIONS OF THE BONES JOINTS MUSCLES, TENDONS ETC

Rieder W. Acute Bone Atrophy (Die akute Knochen atrophie) *Deutsche Zeitschr f Chir* 1936 248 269

Sudeck the discoverer of this 'spotty atrophy of bone in the roentgen film differentiated three types of atrophy or more appropriately, trophic disturbance of the extremities' which may develop after trauma or any kind of inflammation near or distant to the site of activity and which may progress and be demonstrable in but a few short weeks. These three types are (1) the peripheral which develops because of some external source of irritation, (2) the nervous which is due to damage of the peripheral neurons from the posterior spinal ganglia downwards, and (3) the thrombotic due to thrombosis of the femoral vein. All these forms have in common the alteration of the circulation of the blood and of the qualitative nutrition. Numerous experimental researches were undertaken by various authors to study the effect of nerve section on bone. Their results were not uniform however in large part because of inflammatory lesions and frequently quite early ulcers.

The researches of the author are concerned with the pathologico anatomical changes not studied until now, with the systematic histological demonstration of the acute form of spotty bone atrophy and further with the histological researches of experimentally produced acute bone atrophy. A series of typical findings were picked from a large group the most important data were taken from the clinical histories such as fractures gun shot wounds osteomyelitis tuberculosis and whitlows supplemented by roentgen films and histological illustrations. The experimental observations were reported in a similar manner. From all these researches the results were correlated in the following way.

A marked hyperemia of the bone blood vessels could be found even in the early phases of bone atrophy. The resorption of bone in this stage is brought about by narrow spindle shaped osteoclasts. Even after only two or three weeks a very much more marked apposition and resorption is established. In spite of widespread and often piled up chains of osteoblasts the calcification of the wide osteoid trabecular borders is deficient. The pathologico anatomical changes particularly the failure of calcification are the expression of a qualitative defective new bone formation or dystrophy. Clinically, one finds in the stage of acute bone atrophy of the involved extremity a hyperemia and hypertrophy of the skin, edema, cyanosis, diminution of tissue ability to react, delayed appearance and disappearance of reactive erythema on stimulation by cold, pathological changes in the microscopic picture of the capillaries.

Bone atrophy is also produced by immobilization although in this type vasomotor and trophic disturbances are absent. Arterial ligation has no influence upon bone structure. Four to six weeks after thrombosis of the femoral vein a typical picture of acute spotty atrophy occurs, this could not be reproduced in animal experiments by ligation of the larger veins. Determination of the alkali reserve by the Van Slyke method gave no uniform elevation of CO_2 in venous blood just as seldom was there a uniform change of the blood lactic acid. By venous blood perfusion of an isolated area of living bone an elevation of the calcium level of the venous blood is demonstrable although the calcium level remains the same during the normal circulation of mixed arterial and venous blood. In experimentally produced bone atrophy the determination of the calcium level peripheral to the site of diseased bone shows a reduction of calcium. Exclusion of vessel constrictors in animal experiments tends to restrain the development of bone atrophy. Accordingly, cases in which the limb dystrophy has not been of too long duration may be cured by ramisection. The separate parietal layers of the medullary matter are interspersed by a thick network of nerves. There exists a uniform localization and correlation with the vessel damage in the bones. Occasionally after the subsidence of the original stimulus of the dystrophic symptom complex an independent disease of the peripheral vasomotor system may per se. Common to all forms of acute bone atrophy is the damage to the circulation and local metabolism. It forms the basis for the subsequent development of bone dystrophy. The damage to circulation and metabolism leads to a disturbance of equilibrium particularly of bone apposition and resorption so that resorption predominates. The same stimulating factors which dilate the vessels lead to an increase of osteoclasts. The irritating factors which directly or indirectly attack the terminal vessel bed are also responsible for the development of traumatically produced extremity dystrophy. This dystrophy may persist after the exclusion of the original cause. A great number of damaging factors may influence the development of atrophy due to inflammatory extremity dystrophy. In the necrotic form the disturbance of circulation occurs because of direct nerve influence. The existence of the thrombotic form of atrophy is bound up with the optimum acidity. The foremost principle of treatment aims at the eradication of the underlying disease the improvement of circulation and thereby the improvement of local metabolism.

In difficult and refractory dystrophies of the extremity ramisection may bring cure and even progressive improvement may be noted after its use in cases of several year duration.

(A. FRAENKEL) JEROME G. FINER M.D.

Miller, R. H., and Smith-Petersen, M. N.: Further Report on Osteomyelitis at the Massachusetts General Hospital *New England J Med*, 1937, 216 827

The authors report ninety cases of osteomyelitis seen over a period of two years. They find that two years is much too short a time to draw any very definite conclusions. And yet, their tendency is to become more and more conservative in their treatment of acute cases. They attack the local lesion only after the patient's condition has been made as favorable as possible. They advise draining subperiosteal abscesses, and if they definitely suspect that pus is present in the bone, they drill a few holes, but nothing more. In cases with a streptococcus septicemia immunotransfusions should be done, and in those with a staphylococcus septicemia an antitoxin should be tried.

The most discouraging cases are those involving the femur, of twenty-three, only five are completely healed and twelve are being followed. Three amputations were done to save life, two patients died, and one patient was lost from observation. Osteomyelitis of the tibia is less discouraging because the bone is more superficial.

Any bone cavity should be uncovered thoroughly. The wound may then be packed, and the packing changed every few days under an anesthetic, if necessary, or the wound may be closed with glass cannules, such as devised by Smith-Petersen, sewed in at each end. A constant stream of Dakin's solution is then kept running through the depths of the wound. In several cases this last procedure resulted in satisfactory healing in a shorter time.

HAWTHORNE C. WALLACE, M.D.

Loggòscino, D.: The Grocco-Poncet Disease in the Picture of Chronic Polyarthrits (Il morbo di Grocco-Poncet nel quadro delle poliartriti croniche) *Arch ital di chir*, 1937, 45 201

The author presents an excellent review of the literature on Grocco-Poncet disease, or tuberculous polyarthrits. Hippocrates first accurately described the type of people who are most susceptible to tuberculous.

Bonnet in 1845, Fuller in 1860, Charcot in 1861, Lanceraux in 1871, Guhler in 1874, and Mollere in 1888, all contributed facts toward the final recognition of this disease.

Grocco in 1892 finally grouped all the previously known facts concerning the disease and clearly formulated our present concept. In 1896 Poncet presented a clear-cut case in an adolescent, aged fifteen years.

Of 4,499 cases of tuberculosis, Lawrason Brown found only 11 showing signs of arthritis involvement. Dumarest, Wollard, Lieviere, and Papatestosi found only 56 with arthritis in 1,000 cases at the Sanitarium Mongini.

The consensus is that the disease is produced by an attenuated Koch bacillus, as for example, the Calmette-Guérin bacillus.

Rist and Bondet have suggested the possibility that the organism is of an undetermined acid-fast type. Lowenstein suggests avian and Breemen bovine tuberculosis as the cause. Others have suggested a diffusible toxin as the principle factor.

The theory that the causative agent is an ultra-microscopic tuberculosis organism has been advocated by Fontes, Vaudremer, Haudusol, Bezançon, Arloing and Donfanit, Valtis and Kohn. This theory accounts for the absence of organisms and typical pathological tissues at the site of the lesion.

The theory of focal allergy has been suggested, but the author believes it improbable. He believes reflex trophic action is improbable also.

The characteristic signs of the disease are the drum-stick phalanges, pbtibisical habitus, chronic cough, fluid in the joints, positive guinea-pig inoculation, and watch-glass finger nails; and the conclusive roentgen-ray findings make recognition possible. The roentgenogram shows the thickening of the shafts of the phalanges, metacarpals, metatarsals, and shafts of the tibia.

The percentage of positive guinea-pig inoculations is very small, and finding of the tubercle bacillus in fluid is exceptionally rare. Culture of the fluid is rarely positive. Tissue transplants into guinea pigs and biopsies are most reliable for diagnosis.

In the cases reported by the author the number of joints affected in one patient varied from four to thirty-six. Characteristic of this disease is the fact that the smaller joints are most frequently affected, the larger ones rarely.

The course of the disease is variable. Climato-therapy is usually most effective. Immobilization in casts is still a most favorable adjunct. Many cases go on for years, developing abscesses and fistulae. Some of the joints return to practically normal function while others become rigid, and partly subluxated.

The differential diagnosis from syphilis is occasionally difficult to make.

The author reports nine cases of Grocco-Poncet disease and three cases of syphilitic arthritis, which simulated the former. CARLO SCUDERI, M.D.

Fehr, A.: The Clinical Aspect and Pathology of Synovioma (Zur Klinik und Pathologie der Synoviome). *Beitr z klin Chir*, 1937, 165 88

Synovioma is a special form of sarcoma, which may arise from the synovia of joints, tendon sheaths, and hursæ. The long duration and the occurrence of metastases as a terminal feature are characteristic. Microscopically, the picture is often difficult to demonstrate, in the later stages the appearance being mainly that of a spindle-cell sarcoma. This rare tumor was first described by Lejars and Rubens-Duval in 1910. The author found nineteen typical cases in the literature, but he believes that many more have been published under different diagnoses. To the previously tabulated cases in the literature the author adds four, with further observations of his own. Clinical histories and illustrations accom-

pany the article. The diagnosis of synovium was not established immediately in any case. The most frequent site of origin is from the synovium of the knee joint. The tumors are found least often in the tendon sheaths. The first case of the author seems to be the first case reported in which the tumor originated from the tendon sheath. Pain and disturbance of function are mild. Bone changes are not demonstrable early. The majority of patients are between twenty and forty years of age, although a synovium was observed in a nine month old child.

The tumors which are more or less movable in the surrounding tissues often have a soft consistency. The malignancy becomes manifest rather in the later course of the disease. Metastases to the lungs are frequent. It is also difficult to determine the diagnosis macroscopically at operation. Usually a capsule is found from within which it is generally possible to shell out the tumor down to its origin. Synovium may be confused with fungous tuberculosis and chronic bursitis. Furthermore they are to be distinguished from the typically benign xanthomatous giant cell tumors. The histological structure as mentioned already is multiform. Between the spindle celled tissues can be found strands of epithelial cells. Completely immature appearing tumor tissue may be found next to entirely differentiated tissue. The metastases often show the picture of a completely immature spindle cell sarcoma.

Röntgen therapy is not to be employed since the tumors are radioresistant. The author advises exploratory excision and in the circumscribed tumor resection deep into the healthy tissues preferably with a cautery knife. If this is no longer possible early amputation is imperative.

(RATNER) JEROME G. FINDER, M.D.

Lenormant C. *Staphylococcus Myositis* (Les myosites staphylococciques). *J. de chir.* 1917, 2, 1.

Although pyogenic infection of the muscles has always been considered rather rare, careful observations made recently lead to the conclusion that it is not so rare as supposed. In 1930 a series of 63 cases were collected in France. In Japan 130 cases were reported in seven years, all of which were due to the staphylococcus. Cases of this kind are more common in hot climates than in the temperate zone.

A typical case is reported by Arnaud. A man of forty-nine who had been having recurrent skin infections on various parts of the body for about eighteen years developed a suppuration in the right quadriceps muscle. There was a moderate fever but no pain. At operation an enormous collection of pus was evacuated. The opening was counterdrained and a cure was effected in fifteen days.

In most cases a careful history will show that the origin is a skin infection, impetigo or furunculosis. In a few cases however the focus of infection may be in a tooth, the prostate gland or chronic osteomyelitis. Patients who are debilitated by other disease who suffer excessive fatigue from exertion or who are not yet acclimated to the tropics are predisposed

to pyogenic myositis. Traumatism may be a factor in the localization of the infection. The favorite sites of the infection are the quadriceps muscle, the gluteals and other large muscle masses of the lower extremities. Less frequently the suppurative is found in the pectorals, deltoid and triceps muscles. It is usually limited to one muscle group but may occasionally be bilateral in the same group.

Several forms of the disease are described.

1. The very acute septicemic form is an extremely virulent infection which usually proves fatal in a few days. The temperature goes to 40 and over and prostration and delirium are found. True pus is not found but the muscle is infiltrated with a serous fluid and finally becomes indurated. Sometimes in these severe cases streptococci are found. For example a man of sixty-one arrived at the hospital with a high fever and pain in the thigh. On incising a large tumefaction of the thigh the muscle was found to be a grayish color and infiltrated with a serous fluid. Staphylococci were found in the culture and necrotic tissue in sections of the muscle. The patient died in seven days.

2. In the acute septicemic form with multiple foci the symptoms are grave and a guarded prognosis must be given. The mortality is about 20 per cent. Each focus of the infection starts with a swelling which finally becomes fluctuant.

A man of thirty-eight had general septicemia following a finger infection. The blood culture yielded the staphylococcus. Two localized abscesses in the back muscles were opened and staphylococci were found in the pus. Death occurred in three days.

3. Subacute polymyositis with multiple localizations has a tendency to become chronic and persist with intermissions for months or years. The origin of the infection is almost always cutaneous. In one case there was successively an abscess in the left sternomastoid muscle, the gluteal region, the left arm, one knee, biceps of the right arm and the extensor muscles of the forearm. The fever is moderate and goes down after an abscess is drained. Abscesses may follow one another in rapid succession as in the following case.

A woman of fifty entered the hospital with a temperature of 39.5 and an abscess in the dorso-lumbar region which had begun fifteen days before. After excision of the abscess the temperature came down but in a few days it was up again because of an abscess in the biceps muscle. This was drained and six days later a fluctuant mass in the right quadriceps had to be opened. Within a week three other abscesses in the pectoral muscle, the left quadriceps muscle and the left gluteal muscles had to be opened. Pus from all these abscesses showed staphylococci.

4. Isolated muscular abscesses with subacute development are the most common form of staphylococcus myositis. A portal of entry of the bacilli can be found in the skin in more than half of the cases. There is usually a moderate fever, malaise and chill, and pain deep in the muscle which is

exaggerated by motion. Soon a diffuse induration is palpable and sometimes an increased local temperature can be noted. Edema, softening, and fluctuation appear after from ten days to four weeks. The prognosis is good. After incision and drainage the recovery is uneventful and without permanent disability.

5. In about 10 to 30 per cent of the cases of acute and subacute myositis, the process does not come to suppuration but heals by resolution. This may take place in a few days or a few months. For example, a patient had an edema in the calf muscles on the third day after an operation for drainage of a prostatic abscess. This lasted about forty-eight hours, then disappeared and left a rather hard tumefaction which persisted for about four weeks. This form of infection may be multiple.

6. Cold abscesses of muscle of staphylococcal origin are rare. They may be mistaken for tuberculous abscesses, for in fact, most cold abscesses are tuberculous. If there has been a history of fever, staphylococci should be suspected. Incision and drainage will yield pus of a thick consistency, while pus from a tuberculous abscess will be thin. The origin may be proved by finding staphylococci microscopically.

7. The name "circumscribed sclerotic abscess" is applied to a hard chronic tumor mass in the center of which is a very small accumulation of pus. There may be tenderness on palpation. On attempt to aspirate the swelling, no pus may be found, but if an incision is made, a small amount may be discovered if exploration is carried deep enough.

8. A chronic diffuse sclerotic form of staphylococcal myositis may be encountered, as illustrated by the following cases.

A man of thirty-seven had a swelling in the anterior aspect of the thigh which seemed to follow the contour of the quadriceps muscles. The overlying skin was edematous and adherent to the tumor. Sarcoma was suspected and biopsy done. However, at the upper part of the incision inflammatory tissue was found, and on further opening, a pocket containing seropurulent fluid was exposed upward over the femur to the trochanter. The muscle tissue was hard and fibrous.

In another patient, thirty years of age, there was a hard immobile mass in the quadriceps, which was flat and indefinitely limited. At operation it was found to be adherent to the bone. It gave the impression of a sclerosing myositis which had supervened on a suppurative lesion. This mass was freed from the bone, and fat was interposed to prevent re-adherence.

Such a tumor may resemble a sarcoma so much that no characteristics can be distinguished microscopically between the two. The two essential features are hardness and absence of definite limits. Early exploratory operation and biopsy are indicated. In some cases it may be necessary to sacrifice an entire muscle, such as the quadriceps, to cure the lesion.

WM. ARTHUR CLARK, M.D.

Howard, N. J.: Peritendinitis Crepitans. A Muscle-Effort Syndrome. *J. Bone & Joint Surg.*, 1937, 19: 447.

Peritendinitis crepitans is a condition met with infrequently in private practice, but it is quite commonly found in industrial work. A patient suffering with this condition presents a localized swelling of the forearm or leg associated at times with edema and frequently with local heat and redness. He may have a slight fever, but the temperature rarely rises above 99.6°. Severe pain is initiated by bringing into motion the affected tendons and muscles, and crepitus is elicited by palpation or auscultation at or near the musculotendinous junction. In the author's series of thirty-two cases, the extensor carpi radialis longus, extensor carpi radialis brevis, abductor pollicis longus, and extensor pollicis brevis made up two-thirds of the total number of muscles involved. Fourteen of the thirty-two patients were re-employed after long unemployment, or had been assigned to unfamiliar tasks. In other cases the usual employment was continued after the occurrence of direct trauma. In one case only could a bacterial infection be proved.

Under local anesthesia the author explored the involved area and took biopsies in three cases. The findings were a clear jelly-like edema of the areolar tissue about the muscle and tendon. Histological examination showed muscle destruction, thrombosis of the venules, and interstitial hemorrhage of muscle and areolar tissue. There was a loss of muscle glycogen, and relatively acid pH values were found in the tissues, the extracts of which were positive for lactic acid. These findings suggest that the condition was the result of fatigue and exhaustion of the muscle groups. At operation the tendon sheaths were found to be uninvolved. There was a deposit of fibrin in the edematous tissues which was claimed to be the cause of the crepitation. Complete immobilization, including the thumb in cases of involvement of the forearm, was most essential for the relief of this condition. The patients in this author's series averaged ten and one-half days' disability. Various forms of heat, massage, and motion were found only to prolong the disability.

RICHARD J. BENNETT, JR., M.D.

Londres, G., Nava, P., and Campos, O. P.: A Case of Dupuytren's Disease (Considerações sobre um caso de "Molestia de Dupuytren"). *Bol. da Sec. Geral de Saúde e Assist.*, 1936, 2: 95.

The authors describe a case of Dupuytren's disease in a colored woman nineteen years of age. It had begun at the age of twelve years. She was admitted to the hospital for an attack of acute rheumatism; she had had a similar attack seven or eight years before, and it was following this attack that the characteristic Dupuytren deformity began. There was no family history of tuberculosis or syphilis. There are various theories in regard to the cause and pathogenesis of the disease which are reviewed. None of them has been proved and the

cause is apparently not uniform. The histological findings are discussed in detail and microphotographs of the findings are given. The lesions consisted chiefly of the sclerosis or fibrosis of all the tissues of the band from the skin to the bones, the contraction caused by the sclerosis brought about the peculiar claw hand of the disease. The lesions in this case were very extensive, the anatomical lesions were out of all proportion to the functional injury which was only slight.

The authors are very skeptical as to the value of surgical treatment which they believe should be performed only as a last resort after other methods of treatment have failed. The treatment should be based as far as possible on the cause of the disease in the individual case. Opotherapy and radiotherapy have been successful in some cases.

ANDREY GOSS MORGAN, M.D.

Duncan G. A. Painful Coccyx. *Arch Surg* 1937 34: 1083

A review of the anatomy of the coccyx is given with special emphasis on the fact that the coccyx is less protected in the female than in the male.

Painful coccyx generally occurs after the age of thirty but may occur any time after puberty. In this series 7 per cent of the patients were under twenty, 84 per cent between twenty and fifty and 9 per cent over fifty years of age. The youngest patient was fourteen years of age and the oldest sixty-eight. Ninety-seven per cent of the patients were females. Trauma is a prominent feature, 89 per cent of the patients gave a history of a fall preceding the onset of pain. In the remainder the onset of pain was insidious and may have been due to repeated small traumas of which the patient was unaware.

Explanation of the pain that occurs in those patients who do not fall in the aforementioned classifications can be only theoretical. These theories are based on the following factors: (1) infection such as a local manifestation of a generalized infection; (2) symptomatic pain, i.e. referred pain of central origin due to functional or organic disease of the central nervous system such as hysteria, neurasthenia, asthenia, the traumatic neuroses, tabes dorsalis and toxemia; (3) injury, contusions or sprains of the coccyx; (4) postnatal injury such as occurred in twelve cases from pressure of the fetal head on the terminal nerves of the sacral plexus and (5) neuralgic pain, i.e. an initial trauma which causes violent irritation of a nerve and persists without any demonstrable lesion of the nerve.

Contusions of the coccyx and its surrounding soft parts and sprains of the sacrococcygeal joint are probably frequent. The contusions and sprains are usually caused by direct trauma such as a fall in the sitting position. A fall in this position is more likely to traumatize the coccyx in the female because of lack of protection afforded by the ischial tuberosities which are farther apart than in the male and because of the deep posterior position the coccyx occupies in the pelvis whereas in the male with the

coccyx tucked in between the two ischii the force of the fall would be felt first by the ischial tuberosities and then by the prominent sacrum.

The coccyx is surrounded by compact fibrous and muscular structures within this fibrous and muscular network on both sides lies the coccygeal plexus of nerves and on the anterior aspect of the coccyx are the two sympathetic ganglions. Therefore any injury to the soft structures about the coccyx may damage the adjacent nerves and they may be involved in the later stages of scar formation thereby being the cause of persistent neuralgia of the coccyx.

Pain is localized to the coccyx or the surrounding structures. It is increased by pressure as from sitting. On palpation the pain is most commonly caused by pressure from behind on the coccyx and the lower end of the sacrum rather than by pressure on the tip or from in front. Pressure exerted in this manner corresponds to the direction of the original injury. Contraction of muscles as in the act of sitting or rising from a sitting position is painful. Muscles attached to the coccyx in contracting flex it and in so doing stretch the tissues affected by the original trauma. Pain may be present during defecation or urination. There is nothing significant in the character of the pain as it is quite variable. Patients frequently sit with one side of the pelvis elevated to remove pressure from the coccyx. With the index finger in the rectum and the coccyx grasped between it and the thumb tenderness can be localized and the general contour, mobility, angulation and deviation of the coccyx can be determined.

In the differential diagnosis a pilonidal cyst is the most common lesion from which a painful coccyx must be distinguished. In the presence of a pilonidal cyst there is usually a dimpling of the skin or a discharging sinus. No pain is elicited on rectal examination if a pilonidal cyst is present as this lesion is entirely dorsal to the sacrum.

A tumor of the cauda equina sometimes causes referred pain to the coccyx but there may be present sensory changes, saddle anesthesia and paralysis which may be flaccid or spastic. The pain is worse when the patient is lying down than when sitting. There is an increase in the protein content of the spinal fluid.

The prognosis of painful coccyx is good. If non-operative treatment is undertaken recovery usually takes place in from two to four weeks after treatment is instituted. In some patients the recovery is slower the pain gradually subsiding over a period of from four to six months.

During the past ten years only 30 (11 per cent) of the 278 patients included in this study were operated on. They were patients in whom non-operative measures had failed to give relief. Resection of the coccyx yielded satisfactory results.

Non-operative treatment consisted first of all in improving the patient's posture, having her sit erect and pull the buttocks in under the trunk and thereby

taking the superincumbent body weight off the coccyx and causing the soft parts surrounding the coccyx to act as a natural cushion. Hot sitz baths for from twenty to thirty minutes twice each day proved of value. Constipation, when present, was relieved by suitable laxatives. Local massage has proved beneficial to many of these patients. Steady but firm stretching of the coccyx posteriorly has been done on patients for several consecutive visits, with relief from pain. This is done to overcome the spasticity of the muscles having their insertion on the coccyx and to prevent the formation of adhesions and contractures in the sacrococcygeal joint and the surrounding coccygeal structures.

Thirty (11 per cent) of the patients in the group had operative resection of the coccyx. Twenty-seven were females and 3 males, their average age was thirty-two years. The youngest patient was fifteen years of age, and the oldest, fifty-three. The average duration of symptoms before resection of the coccyx was eighteen months. The cases were followed up for an average of two years after coccygectomy. The shortest follow-up period was two months, and the longest five years.

Twenty-two (74 per cent) of the patients were completely relieved of pain. Three patients had only partial relief, and five (17 per cent) were not benefited.

NORMAN C. BULLOCK, M.D.

Kreuscher, P. H.: Semilunar Cartilage Derangements. *Surg. Clin. North Am.*, 1937, 17: 315.

The anatomy of the semilunar cartilages is briefly reviewed, with emphasis on the mobility of the external meniscus as compared with the fixation of the internal meniscus. The mechanism of injury to the internal cartilage with the joint in flexion and adduction is explained, and a description of the common lesions found in this cartilage is given. The symptoms of pain, effusion, and locking are discussed and compared with those found in other common knee-joint lesions. If aspiration is indicated for diagnostic purposes, it should be done into the suprapatellar pouch rather than directly into the articular cavity.

Replacement of a displaced cartilage may be done under anesthesia by flexion, abduction, and inward rotation of the leg at the knee. The leg is then brought quickly into full extension. Hot compresses alone are usually sufficient to cause the joint fluid to absorb. Removal of the cartilage is indicated when there is a history of joint locking and effusion following adduction injury. Careful two-day pre-operative skin preparation, a bloodless field by use of the Esmarch bandage, and the strictest aseptic precautions are all indicated in operations on the knee cartilage. The incision of choice curves downward and medially from near the upper medial border of the patella. The entire internal cartilage should be removed. If the posterior portion is left it may cause further trouble at a later date. Inspection of the joint for other pathological conditions should not be omitted. The synovial lining is closed with 00 cat-

gut, and the fibrous capsule with No. 1 catgut, a whip stitch being used to catch all bleeding points.

The postoperative treatment consists of applying a posterior splint in almost complete extension, and also a Buck's extension of from 6 to 10 lbs. below the knee. If inflammatory changes are present a circular plaster cast should be applied also, for from three to five days. Passive motion is started on the third day, active motion on the fifth, and walking with crutches on the seventh. Weight bearing can begin a few days later. Gentle physiotherapy is started during the second week, and full extension is obtained. Right-angled flexion should be possible in from fourteen to eighteen days. There should be no permanent disability in the acute cases operated early. Chronic or recurrent cases may give from 5 to 15 per cent disability, and this disability may reach 30 or 40 per cent when chronic synovitis and arthritis are present. The morbidity following operations on the semilunar cartilage can be decreased by early diagnosis and operation, strict asepsis, removal of the entire cartilage, and efficient post-operative care.

CHESTER C. GUY, M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Fèvre, M.: The Treatment of Acute Osteomyelitis in Children and Adolescents (*Traitement de l'ostéomyélite aiguë des enfants et des adolescents*). *Ann. méd.-chir., Par.*, 1937, 2: 9.

The voluminous contributions to the literature on acute osteomyelitis in the past fifteen or twenty years testify to the importance of the subject, but also to the fact that there is no one method of treatment which can be depended upon to cure the disease.

As the infection is general as well as local, treatment must be both general and local.

Local or surgical treatment. Conservative, non-operative methods consist mostly in rest and hot fomentations. Continuous extension or plaster casts may be effective in facilitating resolution of the infection.

Simple incision for drainage of a subperiosteal abscess may be all that is necessary in some cases, especially in babies, or in superficial infections. Rost reported 156 cases in which the bone was not opened, with a mortality of only 7 per cent as against a mortality of 14 per cent in 70 cases in which the bone was opened. However, simple incision is not always enough.

Drilling the bone to evacuate the pus is essential, according to Lannelongue, since the infection is in the medullary cavity. Some surgeons drill only when the general condition is grave or when the bone looks white and bloodless at the bottom of the abscess. Although this method is quite generally practiced, the author thinks there are many cases in which it should not be done, for example, cases in which the spongy bone, such as in the vertebrae or ischium is affected, cases in which additional shock to

the system should be avoided and cases in which the bone looks healthy and drilling into it would expose it to infection. Wide opening with the chisel and curette may be demanded by the severity of the lesion in some cases. Local disinfection after wide opening is not considered useful and even may be harmful. Impregnation of the drainage gauze with a bacteriophage may do some good.

Complete resection of the diseased segment of the shaft is advocated by Leveuf, Holmes and others. This is done subperiosteally and provides the opportunity for regeneration of the shaft. A total resection should rarely be done until the second or third week as a secondary procedure. The fear that the bone will not regenerate deters many surgeons from total resection. However, it is rare that the regrowth of bone is not complete and of good quality. The author has seen only one case of non-regeneration. Two factors which may enter into the question of regeneration are alteration of the periosteum and the use of antiseptics which may sterilize the elements of growth.

General or medical treatment. Vaccines should be autogenous if possible. When the causal agent is not known a stock vaccine may be used. A special anti-osteomyelitis vaccine prepared by Salembert of The Pasteur Institute is well tolerated. If the vaccines do not effect the lesion in the bone there seems to be a certain action on the edema, redness and other signs of inflammation in the soft parts.

The use of serums is more logical than vaccines in the more serious cases. The anti-staphylococcus serum has given good results in the service of Ombredanne.

Bacteriophages, although used and recommended by Abbe, Tavernier and others, have not seemed to give good results.

Azure dyes are advised for streptococcus infections.

Other general agents are gold and silver salts, trypollavine, septicemine and uroformin which are administered intravenously. Sorrel has had good results with electrocuprol. Convalescent serum, transfusion and glucose may be given. It seems that general medication is more effective in streptococcus than in staphylococcus infections.

Osteomyelitis gives a mortality of from 13 to 34 per cent as reported by various authors.

In Germany the simple incision of soft tissues seems favored by most surgeons.

In America the Orr method of wide surgical debridement, packing with vaseline gauze and immobilization in a plaster cast has a large following.

The English use various methods. In France a tendency to delay intervention is noted. Abscesses are opened and only later the bone is opened if necessary. Wet dressings and immobilization before operation are in favor. However, Mathieu, André, Martin, Sorrel and Boppe should be mentioned as being against delay in operating.

The procedure in every case will depend upon the age of the patient, the gravity of the infection and

the location. Children under five years old are most susceptible and the mortality in this group is higher than in older children.

In some cases the septicemia is primary and the osteomyelitis secondary. In such a case the localization may be multiple. Blood cultures are positive from the first. General systemic treatment is indicated. In other cases the infection is frankly local and demands local surgery. In cases of definite localization such as a Brodie's abscess with a negative blood culture, complete resection may be the best primary treatment.

Regarding the site of the lesion, the tibia should be opened early while a more conservative procedure should be followed for the femur. A total resection of a fibula would be done with less hesitation than total resection of a femur.

WILLIAM ARTHUR CLARK, M.D.

Artaud, P. A Study of the Treatment of Acute Staphylococcus Osteomyelitis of the Long Bones of the Limbs in Its Early Stage in Children and Adolescents (Contribution à l'étude du traitement de l'ostéomyélite aiguë à staphylocoques des os longs des membres à sa période de début chez l'enfant et chez l'adolescent). Thesis of Marseille. *Press. méd.*, Mar., 1937, 43, 609.

This thesis takes up the treatment of acute staphylococcus osteomyelitis; its chief aim being to bring about a reaction against the tendency toward immediate operation, immediate maximum opening of the bone and early resection. The author has collected forty-eight cases operated on by different surgeons, each of whom has given different rules for treatment.

The author does not attempt to decide definitely as to the relative merits of these different procedures. He says that the variable course of acute osteomyelitis and the simultaneous use of several methods of treatment make interpretation of the results particularly difficult. As an emergency operation is a direct trauma it is often useless and sometimes injurious. Trepanation practiced after a considerable time often gives very favorable general results but very poor local results. Nevertheless it is indicated in cases in which a central acute osteomyelitis is suspected.

Later operation is justified by the fact that the results of early operation are often serious. Even later operation is not without danger and requires much surgical care.

Non-operative treatment is general treatment with anastom or vaccine and local treatment by puncture with strict immobilization of the affected limb has given surprising results. The virulence of the germs can be attenuated and often complete cure brought about. Resection appears to be more attractive than trepanning in cases with extensive local lesions but it involves serious operative trauma and some danger to function, especially in segments of the limb that have only one bone.

Vaccine treatment should be used for it is free of danger but it should be considered only an adjuvant.

treatment. Anatoxin does not seem to be effective in the beginning stage of osteomyelitis, possibly it is useful in residual lesions.

Plaster immobilization seems to be a good method of treating this condition and an excellent means of preventing septic pyemia.

AUDREY G. MORGAN, M.D.

Jaeger, G.: *The Problems in the Treatment of Bone and Joint Tuberculosis* (Ueber die Probleme der Behandlung der Knochen- und Gelenk-tuberkulose). *Orthoképesis*, 1936, 26 760

The author presents for consideration the occurrence, pathological changes and clinical treatment of bone and joint tuberculosis, and, on the whole, indorses the generally accepted principles of therapy. On the basis of the data presented he emphasizes the fact that local treatment is as important as the improvement of the general health by dietetic, climatic, specific, and non-specific therapy, as well as actinotherapy. The majority of the cases, however, defy all conservative methods for years and call for active surgical procedures. There are, in addition, cases in which surgery is indicated at the outset as the local symptoms are very acute despite an otherwise healthy body. On the other hand, under no circumstance should operation be done if after years of careful treatment the general health cannot be improved, or if the tuberculosis has already involved the lungs, throat, or kidneys.

The hospital attended by the author is the sanitary center of about 500,000 inhabitants. In the five years from 1931 to 1936, 56,385 patients were treated there, of whom 936 (1.7 per cent) had bone and joint tuberculosis. The treatment amounted to a total of 19,348 days. Duration of the bone and joint tuberculosis was one year or less in 2.3 per cent of the cases, between two and six years in 16.5 per cent, from seven to fourteen years in 23.3 per cent, from fifteen to nineteen years in 14.6 per cent, from twenty to twenty-four years in 11.9 per cent, from sixty to seventy years in 2.3 per cent, and from seventy-one to seventy-eight years in 0.7 per cent. The localizations of the diseases were as follows: in the hip in 29.6 per cent of the cases, in the knee in 26.2 per cent, in the spine in 15.4 per cent, in the upper extremities in the form of caries in 4.7 per cent; and in the lower extremities as caries in 13.4 per cent. Open fistulas with spondylitis were found in 11.8 per cent, with coxitis in 57.7 per cent, and with gonitis in 15.5 per cent. Cold abscesses with spondylitis were found in 47.2 per cent, with coxitis in 15.5 per cent, and with gonitis in 23.7 per cent. In cases of spondylitis the affected parts were as follows: the cervical vertebrae in 12.5 per cent, the thoracic vertebrae in 56.2 per cent, the lumbar vertebrae in 29.9 per cent, and the sacral vertebrae in 1.4 per cent. Gibbus formation or hunchback was found in 50.3 per cent, and paralysis of the extremities in 6.5 per cent. After critical investigation of the case histories a preceding trauma was found in 14.6 per cent of the cases with spondylitis,

23.4 per cent of those with coxitis, 32.8 per cent of those with gonitis, and 29.2 per cent of those with caries.
(MAKAI) MATHIAS J. SEIFERT, M.D.

Speed, K.: *Hip Joint Fusion*. *Surgery*, 1937, 1 740

Hip-joint fusion has been designed to meet the requirements of a group of hip disabilities, such as (1) residual deformity in adults with hip dislocation following suppurative coxitis or epiphysitis. (2) painful subluxation or luxation of the hip caused by trauma or disease, never reduced, or irreducible except by operation; (3) unilateral, congenital hip dislocation with maximal shortening in adults in whom operation which would limit hip motion is not desired.

The complaint of patients with these disabilities is long-standing or painful displacement of the femur. Examination reveals hips displaced by trauma or disease, shortening of the leg, claudication, and telescoping or loss of the head of the femur. Cases of tuberculous coxitis are excluded from this study. Any pre-existing inflammation must have been long quiescent.

Two objectives are sought: to regain the lost length of the leg, and to hold any gain of length, while a favorable relationship of femur to pelvis is established by a bony fusion.

Skeletal traction is applied to the shortened, dislocated limb by means of a Steinmann pin, and continuous traction is applied to the leg until the maximal gain in length has been reached. After anesthesia has been induced, the patient is transferred to the Hawley table where fixed traction in approximately 15° of abduction is applied. A combination of procedures follows. Through a modified Smith-Petersen incision, the neck and head of the femur as well as the adjacent surface of the ilium are freshened with a chisel. According to the Wilson technique the greater trochanter is split vertically downward by a chisel and pried outward without complete separation and then a quadrilateral bone flap is turned down from the ilium into the split trochanter. Osteoperiosteal grafts obtained locally by the method of Key are packed around this open bone. A reamer is driven through the subtrochanteric femur into the adjacent ilium, and a tibial bone transplant is cut to fit the reamed-out channel and is forced into place, after which procedures a double plaster-of-Paris spica dressing is applied.

The Steinmann pin may be removed from the heel or femur after twelve weeks if the roentgenograms are satisfactory. The plaster-of-Paris spica cast is allowed to remain for at least sixteen weeks. Following removal of the spica cast the patient becomes ambulatory on crutches, but avoids weight-bearing on the fused hip until roentgenograms show a bone formation which will withstand the weight of the body. During this time knee-joint motion is restored by exercises and physical therapy. As a final stage, additional thickness of the sole under the short leg is applied to prevent pelvic inclination and spinal curvature.

RICHARD J. BENNETT, M.D.

Palmer I Ten Operated Cases of Injuries to the Crucial Ligaments in the Knee Joint *Acta chirurg Scand* 1937 79 39r

The author gives an account of ten cases of ruptured crucial ligaments, some of them treated by suture others by grafting. The experience gained justifies the following conclusions:

1 The diagnosis can be made by the drawer sign correctly interpreted. Roentgenograms may support the diagnosis.

2 Early operation generally facilitates direct suture of the crucial ligaments with favorable results. At a later stage some plastic operation is required, the results of which are more uncertain.

3 To obtain successful results in plastic operations it is necessary to have unimpaired lateral ligaments and a joint free from the secondary changes of arthritis deformans.

FRACTURES AND DISLOCATIONS

Lafitte II The Fixation of Diaphyseal Fractures: The Use of Pegs of Os Iurum (A propos de l'enchevêtrement des fractures diaphysaires. Emploi de chevilles en os purum). *Mém I Acad de chir* 1ar 1937 63 65r

Lafitte states that he has used bone pegs for the fixation of diaphyseal fractures in only a few cases and on definite indications such as irreducible non consolidated or improperly consolidated fractures. Bone pegging is a method of osteosynthesis that has a triple purpose: the correction as far as possible of the loss of bone consolidation within a short time which permits mobilization of the neighboring joints, and definite healing of the bone with disappearance of the pegs.

The author has had special pegs of os purum prepared and put up in sterile tubes; they are of various sizes with rounded ends and canalized along their length. Os purum is pure bone prepared according to Orrell's specifications.

Lafitte reports four cases of fracture treated with the use of the bone pegs with excellent results in three cases and a partial failure in one case. The last result is attributed to too early mobilization. Mobilization should not be attempted until the callus is well formed.

When this method is used the ends of the fractured bone should be brought into as close juxtaposition as possible, but the proper placing and fixation of the bone peg is of prime importance.

The author has found that pegs of os purum are easily absorbed; they can be used whenever it is not desirable to use an autogenous bone graft and with much the same results. The healing of the fracture and the formation of callus indicate the right time for mobilization.

Alice M. Meyers

Rodino D The Action of Iodoform upon the Callus of Fractures (L'azione dello iodoformo sul callo di frattura). *Clin chir* 1937 11 219

The author undertook the study of iodoform which is commonly used in the sterilization of

compound fractures and of its effect upon callus formation. Bruns was the first to recognize the delay of bony union after the use of the Lister method. Experimental work of Boerema showed that 5 per cent tincture of iodine and 3 per cent phenol solution retarded callus formation while hydrogen peroxide and iodoform gauze had no effect whatsoever upon callus formation.

In the experimental study the author used large rabbits. He surgically fractured the fourth metatarsal of the hind legs, applied crystals of iodoform to one and simply closed the skin over the second without applying any antiseptic. The animals were killed at the end of ten, twenty, thirty, forty, fifty and sixty days. Control roentgenograms were taken and microscopic sections of each specimen were examined.

In the article are presented numerous roentgenograms and microscopic sections which clearly demonstrate the fact that the fracture treated with iodoform showed a marked delay in callus formation.

The author believes that the iodoform gauze did not cause delay in callus formation in the experiments of Boerema because the quantity of iodoform in the gauze was very small.

The author believes that any antiseptic strong enough to kill bacteria in a compound fracture also injures the bone cells and thereby delays callus formation.

Carlo Scuderi M.D.

King T Some Difficulties in the Treatment of Dislocations of the Cervical Vertebrae. *Australas J Surg* 1937 6 380

The author believes that compression fractures are rare in the cervical region; that fracture dislocations are not uncommon and that dislocations in the cervical region are common. He finds that injury in the cervical region occurs usually about the atlas and axis and also about the fourth, fifth and sixth cervical vertebrae. Dislocation between the atlas and skull is a rare injury. Injuries of the axis and atlas carry a high mortality.

King believes that in the high cervical hyperflexion injuries immediate reduction is desirable. He advises that the neck be elongated by temporary strong traction and hyperextended. The arch of the atlas may be pressed backward with the thumb or index finger in the pharynx. Thereafter a cast is applied. If paralysis is present the deformity must be reduced as soon as possible. The manipulative reduction is first performed and then maintained by skeletal traction. Traction without manipulation generally fails to reduce the deformity. He does not believe there is danger in reducing the deformity unless incorrect procedures are adopted. As no union may result from interposition of the ligaments he believes the cast should not be removed for from three to six months and states that an exact reduction cannot always be obtained, especially in cases of more than ten days duration. In cases of partial displacement he advises the reduction of the deformity at once and the application of a plaster of Paris

cast. In cases of complete displacement, especially when complicated by a cord injury, it is essential to anesthetize the patient and reduce the deformity by Taylor's method. In hemi-dislocations lateral flexion and rotation of the neck are also necessary manipulations. It is much better to apply a plaster-of-Paris cast after an early reduction by Taylor's method. If there was any paralysis, especially with skin anesthesia, it is wrong to apply such a cast if it covers the anesthetic area, but treatment then can be carried out by skeletal traction. King does not agree with certain authorities and neurologists, that in the presence of paralysis the displacements of the spinal column should be ignored.

Latent paralysis may be progressive if the displaced vertebrae are not correctly adjusted, or it may even develop, even despite a good reduction. The author believes the best protection against the onset of paralysis is reduction of the deformity. At all times over-traction should be avoided. Flexion is a more common cause of injury than extension of the cervical segment. The first step is traction in the long axis of the neck, it is essential to hyperextend the neck slowly. Then the dislocation is reduced by manipulation. Traction should not be continued during the application of a plaster cast as this may over-stretch the neck musculature and intact ligaments and cause a further tendency of the vertebrae to redislocate. When the displacements recur the author always incorporates one or two finger screws in the casts, especially for severe cervical injuries. King states redislocation is a common difficulty in spite of the use of a well-made cast and when the redislocation is unreduced it cannot be said what disability may develop in later years. Complete fracture-dislocations of the cervical vertebrae, he believes, are reduced more easily than pure dislocations, but unfortunately injury to the spinal cord is common, and in such a case a plaster-of-Paris cast is usually contra-indicated. Reduction should be maintained by hyperextending the neck over a small pillow acting as a fulcrum on the lower segment of the spine and suspending the head by skull calipers. The head of the bed is raised about 10 in. and a weight of 8 or 10 lbs. is attached to the calipers over a pulley. Slight movements of the patient are encouraged so that pressure over the back is avoided. The author has found a short mattress to be of great assistance in the nursing of these cases. After a week or more, when the paralysis has decreased, the calipers are removed and a plaster cast including the head and forehead is applied.

King believes that skeletal traction should be reserved for cases in which paralysis is present, cases of some days' or weeks' duration, cases in which other injuries are present, severe critical injuries in the presence of severe shock or other constitutional disturbances which prevent immobilization in a plaster cast. The development of paralytic ileus is avoided by forbidding the administration of purgatives and enemata, bowel lavage, frequent rectal intubation, pituitrin, and other stimulating agents

to abdominal viscera. He believes that morphine is of great value in relieving pain and seems less harmful than strong stimulants to the bowel. The diet should consist mainly of fruit drinks, glucose, and the like. The bowels may not be evacuated for a week or two. A radiant heat cradle is placed over the abdomen. The lower limbs are slightly flexed for at least part of the day. The retained urine is drained continuously. The indwelling catheter is changed every ten days. If urethritis becomes troublesome a very small size catheter is introduced. Saline or weak boric-acid solutions are used for irrigation. A suprapubic puncture or cystostomy is both unnecessary and dangerous, especially if performed early. Every hour 100 c.cm. of saline or diluted antiseptic solution are run into the bladder. A hexamine mixture is prescribed. The article is well illustrated.

EMIL C. ROBITSCH, M.D.

Massart, R., and Vidal-Naquet, G.: The Consequences and Late Results of Traumatic Dislocations of the Hip (*Les séquelles et les résultats éloignés des luxations traumatiques de la hanche*). *Bull et mém Soc d chirurgiens de Par.*, 1936, 28:439

Although it has been generally thought that a dislocated hip, well reduced, is without serious consequences, a follow-up of some cases many years after the accident forces us to revise our opinion.

The great amount of force which is necessary to tear the head of the femur out of the acetabulum must do an enormous amount of damage to the soft parts. The joint capsule and the blood vessels around it are torn, the round ligament is pulled loose; the muscles may be ruptured; and the tendons are severely stretched, then, the trauma of reduction is added to the original trauma.

There are two consequences of these dislocations which stand out prominently: ankylosis and arthritis deformans.

In one case, a man of twenty-five had an obturator dislocation of the hip. After two attempts at reduction had been tried, the author was called ten days after the accident to do an open reduction. However, instead of doing an open operation, he was successful in changing the obturator position of the head to an iliac position, from which a closed reduction was accomplished. The leg was then immobilized in plaster for three weeks. After two months, the roentgenogram showed a bridge of ossification between the trochanter and the ilium. The patient walked well but motion in the hip was limited. At the end of five months there was a solid extra-articular arthrodesis and also another bony bridge extending from the ischium toward, but not reaching, the lesser trochanter. The patient was able to resume his usual work and had no pain in the stiff hip.

In another patient, the hip became stiff in slight flexion following a dislocation. The reduction had been done about three weeks after the accident. Because of impaired function in the hip, an operation was done. A large mass of bone was found extending from the trochanter to the ilium. This was removed

with some difficulty and a cast was applied which immobilized the hip for twenty days. Normal motion and good function were restored.

Bone absorption, aseptic necrosis, arthritis deformans and osteochondritis dissecans may follow the trauma of a dislocated hip. If such a case occurs in a workman it is important that the relation of the effects to the original accident be definitely established.

A man thirty years of age had a dislocation which was reduced and was kept at rest for a month. He made a good recovery and seemed to be normal until about eighteen months later when he began to limp and to have an ache in the hip. The roentgenogram at this time showed a deformity of the head of the femur and osteoporosis of the upper part of the shaft.

It is quite probable that the rupture of these nutrient vessels in the round ligament at the time of the dislocation resulted in impairment of the circulation of the femoral head thereby causing the supervening necrosis and osteoporosis. The author cites a case reported by Phemister and Stewart of a young man with a gradually progressing malformation of the head of the femur due to aseptic necrosis coming on five months after a perfect reduction of a dislocated hip. Animal experiments by Stewart show that in adults, a necrosis of the femoral head usually follows section of the round ligament. This necrosis of islands of bone in the head adjacent to living bone is what makes the irregularities seen in the roentgenogram. The defects which are present in the support mechanism of the joint cause limping and weakness.

From experience with these cases it is concluded that the dislocations which are reduced late in from one to three weeks are quite likely to be followed

by some of the deformities and lesions described above.

WILLIAM ARTHUR CLARK, M.D.

Brooke R. The Treatment of Fractured Patella by Excision. A Study of Morphology and Function. *Bull. J. Surg.* 1937 24 733.

The author advocates removal of the fractured patella. The fractured portions are shaded out of the tendon and the transverse gap is then closed with interrupted stitches of silk or strips of fascia lata. Great care is taken to sew the lateral expansions.

In support of his contention that this is the best method of treatment he states:

1. Preparations of the knee joint in the fresh state obtained from the postmortem room seemed to show that an equal pull upon the quadriceps tendon produced even smoother extension of the knee joint without the patella than with it present.

2. Regarding the anatomy of the patella and patellar ligament a longitudinal section of the knee joint shows that the quadriceps tendon merely passes over the patella to become continuous with the patellar ligament below. The upper and lower margins of the patella are covered with fat and give no attachment to any ligamentous fibers. Lateral expansions of the quadriceps tendon pass on each side of the patella. These lateral expansions are torn and it is the suture of these lateral expansions which is the most important part of the operation of repair.

3. The results in thirty cases that he has so treated in the past seven years were excellent from the standpoints of shortening the time of disability and complete return of function.

HAWTHORNE C. WALLACE, M.D.

SURGERY OF THE BLOOD AND LYMPH SYSTEMS

BLOOD VESSELS

Ascroft, P. B : The Basis of Treatment of Vaso-spastic States of the Extremities: An Experimental Analysis in Monkeys. *Brit J Surg*, 1937, 24 787

The author presents a report of a study made in the rhesus monkey of the earlier and later effects of division of the vasomotor fiber at various levels by means of skin-temperature records. The clinical inferences from this study are also summarized. In twelve monkeys a cervicothoracic sympathetic ganglionectomy was done. In only one of these was there a good degree of vasodilatation that persisted, and in at least two animals the sympathectomized side was more sensitive to cold than the normal side. Eleven of the animals developed a very considerable degree of adrenalin sensitization, about ten times the normal, while the remaining monkey, the one already mentioned, was about half as sensitive as the others. In two monkeys the lumbosacral sympathetic chain from the vein to the lower end of the sacrum was excised. Both of these behaved much like the animals which were sensitized by the cervicothoracic sympathetic ganglionectomy. There are many possible factors to account for the recovery of activity in the sympathectomized vessels, the enhanced susceptibility to external cold, to adrenalin, and to some adrenalin-like substance produced in the body are of special importance.

In eight monkeys the thoracic chain was cut just above or below the third thoracic ganglion. In none of these was the sympathectomized side constricted as rapidly, to a greater extent, or for as long a time as the normal side on exposure to cold. Adrenalin sensitization developed, but it became about one-third as intense as after postganglionic division. In two monkeys the lumbar chain had been removed from the renal vein to the level of the bifurcation of the aorta. In both, vasodilatation persisted, and adrenalin sensitization approximated that seen after preganglionic division of the vasomotor fibers in the upper limb.

The experimental data secured by the author reveal that preganglionic operations are much more effective in producing chronic vasodilatation than postganglionic operations. This agrees with clinical observations. The conventional operation for vaso-spastic states of the upper limb is not incomplete but too complete, and it would seem rational to replace it by a preganglionic operation, the value of which in the lower limb has already been proved clinically. In man the preganglionic fibers to the arm arise from the second to the sixth or seventh thoracic anterior roots. There is no need to perform an extensive laminectomy to divide these fibers by a direct attack on the anterior roots, all the preganglionic fibers may be interrupted by dividing the thoracic sympathetic chain just below the second

thoracic ganglion and by severing the connections to the second thoracic nerve. By this means all the postganglionic fibers to the brachial plexus are preserved, and Horner's syndrome is avoided.

The author notes that the operation usually performed for vasospastic disease of the lower limb has stood the test of time and there is no reason to modify it. From the theoretical and experimental point of view, it would seem best to leave the fourth lumbar ganglion intact and to take only the second and third, for no white ramus reaches the fourth ganglion and it gives off a grey ramus carrying postganglionic vasomotor fibers to the leg.

This worker concludes that attacking the vasomotor fibers to both the arm and leg at the same time as they lie in the spinal cord is impractical because the arm fibers are situated too deep and too close to the pyramidal tract.

HERBERT F. THURSTON, M.D.

Uggeri, C : Experimental Traumatic Aneurysm (Aneurismi traumatici sperimentali) *Arch ital di chir*, 1937, 45 361.

The literature on the subject is carefully reviewed.

The author carefully defines aneurysm and periarterial hematoma. Many controversial opinions of the literature are quoted. The consensus is that an aneurysm is a condition in which the blood circulates in an enclosed space, and cannot enter into the surrounding tissue.

An anatomico-pathological discussion of true and false aneurysm is given.

In twenty-seven experiments on the femoral artery of dogs, the author was unable to produce any true aneurysms. The artery was pinched with a forceps, then the leg was placed in a loose cast. In only one experiment was the author able to obtain a secondary hemorrhage with a tumor mass simulating an aneurysm.

In four experiments, a section of the femoral artery was isolated with rubber clamps. Then with a syringe and needle, physiological salt solution was injected under pressure until the section was twice as long and three times as large in diameter. At the end of twenty-five, twenty-eight, and forty-five days these same segments were examined. With the exception of a slight increase in diameter, and a few irregularities of the intimas, the vessels had returned to normal.

According to the article the real cause of traumatic aneurysm is unknown, and traumatic aneurysms can be produced only by penetrating wounds. The fibrous sac is not produced by a distension of an occluding thrombus of the primary arterial wound, but is due to the stratification laid down by the fluid on the inner aspect of the vessel, according to the mechanism described by Negroni.

CARLO SCUDERI, M.D.

Beluffi E L Cirroid Aneurysm (Sulf aneurysma cirroide) Policlin Rome, 1937 44 sez chr 221

The authors describe two cases of cirroid aneurysm or racemose angioma.

The first case was that of a farm laborer twenty-nine years of age who noticed a swelling on the left buttock, for which there was apparently no cause. This is an unusual localization for such an aneurysm. It slowly increased in size and was diagnosed as a lipoma and excised. An uneventful recovery followed. Examination showed it to be a cirroid aneurysm. The second case was in a young man of nineteen years who had suffered two injuries of the occipital region from falls. Three or four months after the second accident a swelling developed in the occipital region. It proved to be a cirroid aneurysm, which was removed and the patient made an uneventful recovery.

The histological findings are discussed in detail and microphotographs given. From the findings in their own cases and a study of those reported in the literature the authors conclude that cirroid aneurysm is not a true tumor as has been claimed by some investigators, but is a complex of purely mechanical vascular changes secondary to the formation of multiple peripheral arteriovenous aneurysms. It is not formed by the artery alone; the artery, the vein and the capillaries are all involved in its formation; the latter are dilated, elongated, and tortuous because of congenital malformation or trauma, which is a result of abnormal communication between the artery and vein. The most striking histological finding is an irregular proliferation of the intima with no degenerative or inflammatory lesion.

Treatment should be early and radical, and the method of choice is total removal.

ANDREW GOSS MORGAN M D

Jacobi H G The Blood Cholesterol Response to Intravenous Therapy in Peripheral Arterial Disease *Am J M Sc* 1937 493 737

In a report based on twelve cases the author concludes that patients with painful ulcerative lesions of the extremities due to peripheral arterial disease should receive intravenous treatments with sodium iodide or sodium-chloride solutions and the cholesterol content of the blood should be used as an important guide and indication in the administration of such therapy. Patients with such lesions had a subnormal or a low normal blood cholesterol.

After intravenous treatment with sodium iodide prepared in physiological saline solution cessation of pain was obtained in all cases. During this treatment blood determinations were made at intervals of from four to six days. There was a rise in the blood cholesterol content with a subsequent fall. The ulcerative lesions were healed after a period of treatments varying from four to six weeks.

The author concludes also that it is hardly advisable to await the recurrence of ulceration and pain in such cases. The average period of relief is about eight months. That period of time might be the

accepted interval at which these periodic courses of treatments might be instituted unless indications exist for an earlier resumption of the therapy.

HEARST F THURGOOD M D

Cornil L Carcassonne F Mosinger M and Haimovici H Experimental Arterial Emboli (Les embolies artérielles expérimentales) *Ann Anat Path*, 1937 14 191

The histophysiological study of parietal arterial reactions following arterial obstruction by emboli is interesting not only because of any conclusions concerning therapeutics which might be made but equally from the point of view of pure pathological histology. In order to draw precise conclusions of therapeutic value such as would be applicable to arteriotomy or embolectomy the authors feel it is important to know the exact site as well as the mechanism of the development of this type of blood vessel lesion.

They have attacked the problem in two ways by producing in animals both septic and aseptic emboli. Using dogs as subjects they introduced bits of striated muscle by means of a fine trocar into the left renal vein, after nephrectomy, or into the great sacral trunk of the aorta, a large vessel in dogs. Rigorous technique was used to preserve asepsis in the one series, in the other the muscle fragments were inoculated by a culture of streptococci obtained from human subjects suffering from acute subacute and chronic streptococcal endocarditis and injected into both normal dogs and dogs with experimental endocarditis. With this general plan of production of lesions the authors studied their results from the purely histological angle as well as determined the mechanical and infectious factors in the lesion development.

In the case of the aseptic embolus the process was dominated by a dystrophic infiltration and capillary changes in the adventitia and by degenerative changes in the media. These lesions are dependent then on the suppression of the endovascular blood current which results in adventitial and mesarterial trophic changes. The reactions following a septic embolus were distinguished by a polynuclear infiltration of the embolus itself by an early endothelial inflammatory change, degeneration of the media and a polynuclear infiltration of the adventitia and media. The result was a polynuclear infiltration within the lumen of the vessel within its walls and on the outside of the vessel with the combination of both trophic or mechanical and infectious factors in the production of the lesion.

Septic lesions produced in dogs suffering from experimental endocarditis did not differ from septic lesions in normal dogs.

Whether the lesion was produced by a septic or aseptic embolus the adventitial change always dominated the histophysiological picture. The changes occurred earlier in the cases of the septic emboli than in the cases of the aseptic emboli where the adventitial changes were purely trophic in nature.

The authors arrive at two conclusions of clinical value 1. In early cases, embolectomy appears to be the rational treatment. Experimental lesions in dogs showed the adventitial reaction at its height at the end of six days in the aseptic lesions, and at the end of about twelve hours in the septic emboli 2 In more advanced lesions embolectomy is irrational and ineffective, arteriectomy or sympathectomy is preferable

JOHN MARTIN, M D

Gruhani, G. M.: Spontaneous Thrombotic Embolism of the Tibioperoneal Trunk, with Secondary Thrombotic Emboli. Embolectomy. (Trombo-embolia autoctona del tronco arterioso tibio-peroneale con trombo-embolie secondarie Embolectomia). *Arch ital di chir*, 1937, 45: 129

The author gives a case report of a man sixty-one years of age who was taken ill with progressive pain, numbness, and discoloration of the left leg

The dorsalis pedis, and the popliteal and femoral vessels could not be palpated A diagnosis of embolism of the femoral artery was made, and operation was performed eight days after the beginning of the symptoms. A 20-cm thrombotic embolus was removed from the external iliac, femoral, and popliteal arteries

The patient's condition improved. However, several days later, the leg became gangrenous and an amputation at the lower third of the femur was done The operative specimen was examined and an 8-cm embolus was found in the lower portion of the popliteal artery and the anterior and posterior tibial arteries The vessels showed high-grade arteriosclerosis which was believed to have been a con-

tributory cause The patient was not found to have either valvular or muscular affliction of the heart

A review of the literature was presented.

CARLO S. SCUDERI, M D.

BLOOD; TRANSFUSION

Baker, S. L.: Urinary Suppression Following Blood Transfusion. *Lancet*, 1937, 232: 1390

Baker reports the result of his examination of a kidney sent to him on account of the death of the patient following a blood transfusion This patient received a citrate transfusion of 800 c cm. of blood which had been kept standing for two hours at a temperature of 130° Fahrenheit Following the injection of this material, the patient produced some dark brown urine containing hemoglobin derivatives A nearly complete suppression of urine followed, and the blood urea reached 540 mgm per 100 c cm. on the twelfth day The patient died on the fourteenth day Examination of the kidneys revealed a large amount of dark brownish pigment in the renal tubules

On the basis of experimental work conducted by Baker and Dodds, the author states that when hemoglobin is injected into the circulation it is eliminated without damage to the kidney in patients whose kidneys are producing a neutral alkaline urine, however, in patients whose kidneys are producing a concentrated acid urine, the hemoglobin is deposited as hematin in the kidney tubules, and the suppression of urine is probably brought about by the obstruction of these tubules

G DANIEL DELFRAT, M D

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE POSTOPERATIVE TREATMENT

Hart D. Operation Room Infections Control of Air Borne Pathogenic Organisms with Particular Reference to the Use of Special Bactericidal Radiant Energy Preliminary Report. *Arch Surg* 1937 34 874

From Duke Hospital in Durham North Carolina comes a report of a research conducted there by Hart and his associates. This report should be of great interest to the surgeon. It concerns itself with the use of special radiation tubes for the control of air borne organisms in operating rooms. Though this is but a preliminary report and while many phases of the subject are still under investigation enough has been demonstrated to restore new hope and confidence in the possibility even certainty of operating in the future without infection and wiping out the dread of bacterial contamination from an uncontrollable source.

Hart reports results obtained by the concerted effort of himself and co workers extending over a period of five years. The purpose of the studies was to control the occasional sporadic operating room infection occurring in a case of otherwise clean operation. They found that the great majority of infections about 90 per cent were caused by staphylococcus aureus, usually of the hemolytic type occasional mild infections were caused by the staphylococcus albus and rather rarely severe infection was caused by the streptococcus hemolyticus. A careful check up by cultures was made of all operating room equipment and supplies as well as of all procedures in operating room technique. These were found to be satisfactory and not responsible for the infections. The investigators arrived at the conclusion that pathogenic organisms in the air contaminated by human beings are responsible for most of the operating room infections. In fact they consider these to be of major importance.

An intensive study of the air in the operating room was made by cultures. This showed that the incoming air from the forced ventilating system taken from above the roof and washed was practically free from pathogenic bacteria. Again cultures of the air taken when the room was occupied and as quiet as possible showed far more organisms than when the room was unoccupied and having the air agitated by electric fans. Further investigation brought out the point that from 60 to 80 per cent of the operating room personnel and the general population at times have staphylococcus aureus frequently of the hemolytic type in the nose and throat.

Apparently this was where the source of contamination of the air was to be sought. Various observations brought out the fact that the amount of contamination was determined by the number of per-

sons present and the duration of occupancy. Moreover, the degree of contamination also varied in the same room under similar conditions at different times of the year depending on the percentage of persons who were carriers at that time and the intensity of the growth in the noses and throats of the carriers. These observations led to a concerted effort to minimize the number of organisms in the air of the operating room. A considerable measure of success as represented in the reduction of the number of organisms by from 60 to 80 per cent was attained. This was due to the rigid observance of the following measures. The number of persons in the operating room was cut to the minimum masks were worn over the nose and mouth at all time all persistent carriers of the staphylococcus aureus or of the streptococcus were kept out of the operating rooms at all times the rooms were painted frequently and washed daily with an antiseptic solution by forced ventilation the contaminated air was replaced by clean washed air taken from above the roof.

Despite this rigid quarantine and other precautionary measures which brought about a considerable reduction in the number of contaminations of the air by hemolytic staphylococci there was not as yet a complete elimination of the operating room infections. Usually in such cases a change in the preparation of the skin or in the scrubbing technique is made while the real source of contamination from the air is unsuspected. Further examination brought out this important fact in every case of infection in which cultures of the air had been taken the organism cultured from the wound was identical with the one cultured from the air during the operation.

Further preventive measures were resorted to. Double doors were put in so as to prevent currents of air from the wards reaching the operating room. The ventilating fans were set so that the inflow of clear air was greater than the outflow thus forcing a current of air out of all cracks and open doors. This again brought about a marked drop in the degree of contamination of the air. There were however still peaks during epidemics of infections of the respiratory tract when the number of organisms in the air was greater. To perform major operations requiring exposure of a large raw area such as an extrapleural thoracoplasty or radical amputation of the breast when there was this grave danger of infection necessitated further precautionary measures.

Hart and his associates turned to irradiation with such wave lengths as are known to kill organisms. Various manufacturers of ultra violet ray lamps were asked to cooperate in the experiments to the extent of furnishing the necessary equipment. After extensive researches a device was designed and constructed which supplied a sufficiently high level of bactericidal radiation to accomplish destruction of the bacteria without the intensity being of such a

character as to create any discomfort to the patient Hart's article supplies a description and diagram of the special radiation tubes used in his researches to sterilize the air

Some very interesting developments followed the installation of these special radiation tubes which should prove of inestimable value in appreciably lowering and eventually wiping out the so-called skin contaminated wounds. We list a few of the more important results:

1 Sprayed cultures of staphylococcus aureus hemolyticus and a mixture of many organisms when exposed to this radiation in the approximate position of the operative wound were killed at a distance of 5 ft within less than from one to five minutes, the time depending on the density of the inoculation

2 With the tubes burning, practically no organism could be cultured from the air within a radius of 8 ft from the operative field

3 In the outlying parts of the room, 13 ft from the center of the cluster and 11 ft from the nearest tube the number of viable organisms falling out of the air was reduced from 60 to 90 per cent

4 Wounds in rats exposed to the eight tubes at a distance of 5 ft. for thirty minutes healed better than in the control animals.

5 All patients operated on under the radiation from these tubes had an unusually smooth convalescence. There were no infected wounds and no culture of material from the wound showed a growth. Approximately fifty patients were operated on, two for an ulcerated carcinoma of the breast. In all cases there was less elevation of temperature, less pain, and a smoother and more rapid convalescence than in the control group of patients. Therefore, it appears that ultimately it will be possible to eliminate almost completely operative wound infections in clean operations

MATHIAS J. SEIFERT, M.D.

Leriche, R.: *New Aspects of Postoperative Illness* (Aspects nouveaux de la maladie post-opératoire) *J. internat. de chir.*, 1937, 2 177.

Leriche maintains that the chief cause of postoperative illness is not infection nor chemical changes, but trauma to the nervous system and especially to the vasomotor mechanism. So-called postoperative complications, such as shock, pulmonary collapse, and phlebitis, are but "exaggerations" of the normal phenomena produced by operation. Infection and hemorrhage are true complications and not a part of postoperative illness

Postoperative illness is produced essentially by vasomotor reflexes from the region of the wound. Shock is the most severe form of this postoperative vasomotor depression

The usual discomfort experienced by the patient after operation, pains, thirst and the retention of urine, is the second form of this illness. This usually subsides spontaneously, but it may be exaggerated and prolonged if the traumatism has been considerable and the signs of overstimulation of the sympathetic system are exaggerated

Pulmonary collapse is also an exaggeration of the retraction of the periphery of the lungs which may usually be demonstrated radiologically after operation or, as the author has repeatedly shown, even while the patient is on the operating table

The modifications of the blood, especially the usual increase in blood platelets, that follow operation may cause thrombosis and phlebitis

Another form of postoperative illness is the toxemia, that clinically appears later, this the author believes is caused by humoral changes that in reality occur early. These changes are due in part to local tissue destruction, but probably to a greater extent to lysis of proteins at a distance caused by sympathetic nervous-system reflexes

These findings suggest measures for the prevention of postoperative illness. In the first place, it is important to avoid injury to the tissues at the site of operation by careful handling. In the second place, it is necessary to employ local anesthesia as far as possible, the author has used local anesthesia in 6,757 of 19,650 operations, or about one-third. This experience has shown that local anesthesia is definitely of advantage in reducing postoperative illness by blocking the centripetal conduction in the zone of operation. The third factor is to effect careful hemostasis because loss of blood facilitates vasoconstrictor reflexes and shock. The fourth factor is to employ transfusion of blood after any severe operation, such as gastrectomy or subtotal thyroidectomy, this procedure aids in establishing the equilibrium even if there has been no excessive blood loss. Also, the local application of the infra-red rays is of value in reducing postoperative malaise; it acts apparently by increasing local hyperemia and thus possibly diminishing the absorption of proteins

The author is of the opinion that postoperative illness as ordinarily described is the type that follows abdominal operations. The symptoms following operations in other tissues are of a different type according to the site of the operation

ALICE M. MEYERS

Miller, A. H.: *Postoperative Pulmonary Complications*. *New England J. Med.*, 1937, 216 973

In this article the author attempts to prove that the choice of method and care in the administration of anesthetics are important factors in the prevention of postoperative pulmonary complications. If the records show fewer pulmonary complications than some other clinics where skillful surgeons are assisted by professional anesthetists, what explanation can be offered for the comparative freedom from such complications in the author's series of cases?

First to be considered is balanced anesthesia. This, when combined with the regional use of procaine, provides muscular relaxation and permits surgical manipulation under a lighter general anesthesia. Other important factors are the use of an excess of oxygen, with entire absence of anoxemia, the aseptic maintenance of the anesthetic apparatus, which prevents the carrying of respiratory infection

from one patient to another an even depth of general anesthesia and the avoidance of the deeper zones, and the attention to minute details having to do with the care of the patient in the operating room and during the period of recovery

HOWARD A. MCKNIGHT M.D.

Schmid H. H. The Prevention of Postoperative Thrombosis and Embolism (Verhütung von postoperativen Thrombosen und Embolien) *Zentralblatt f. Gynäk.* 1937 p. 307

In the period from January 1, 1935 to June 30, 1936 there was not a single thrombosis of the leg or pelvic vessels and no death from pulmonary embolism in 500 major obstetrical operations. These results were obtained since the principle of raising the foot end of the bed after each operation has been carried out in practice. In the eight years from 1927 to 1934 there were 81 cases of thrombosis of the leg and pelvic vessels in 2,463 major obstetrical operations i.e. 3.3 per cent plus or minus 1.0 threefold median error and 22 cases of death from pulmonary embolism i.e. 0.9 per cent plus or minus 0.5. With equal consideration of the threefold median error there should have been among the 500 women operated upon during the last eighteen months, from 12 to 23 cases of thrombosis and from 2 to 7 cases of mortal embolism. In reality however there was not a single case of thrombosis nor a mortality from embolism only in two cases were symptoms of an embolic infarct noted. This decrease in the frequency of thrombosis and embolism cannot be due to temporal and focal fluctuations since in 700 puerperal women four large thromboses of the leg and pelvic vessels were observed. In these cases the women were mostly young and robust and the foot end of the bed was not raised at first. Only once in all these cases thrombosis occurred in spite of the raised position of the bed. Furthermore it cannot be maintained that raising one end of the bed after an operation is a safe guarantee in all cases against thromboembolism. However it is undoubtedly of great importance when it has succeeded to reduce thrombosis and embolism so effectively in a considerable number of cases. We must leave out of consideration other improvements that might be looked upon as explanations of the favorable results because during the eighteen months covered by the report these improvements caused no essential changes from results obtained the eight preceding years. The proportion of older and corpulent women was about the same. The operability of uterine-cervix cancer was about 70 per cent both before and after raising the bed. The preparations before the operation, Kauffmann's diuresis test of cardiac function, the operative technique the aseptic the peritoneal ether narcosis and the after treatment all the have remained unchanged throughout the years. Since 1918, more emphasis has been placed upon the value of inhaling carbonic acid during the after treatment. The practice of administering

sympatol in all of the cases is no longer uniformly carried out.

The raising of one end of the bed is accomplished by placing two 10 in. wooden blocks under the bed immediately after the operation. The bed is kept in this position for the four following days. The reclining position half way between sitting and lying in cases of laparotomy, has been given up entirely. The discomfort which many patients experience because of the lower position of the upper part of the body, can be relieved by the use of pillows while the legs still remain in a higher position. In any case blood circulation and breathing occasion less cause for worry than before conditions of shock disappear more rapidly than when the body is in a normal position. The favorable influence of the raised position on the prevention of thromboembolism is explained by the fact that there is a better current and better circulation in the vessels of the lower part of the body. It is important that the patient be placed in this position immediately after the operation and not hours or days later. In addition to stimulating the blood reflux it should be kept in mind that the raised position tends to prevent the mixing of portal blood with the blood of the vena cava. This is an important circumstance if we accept Hlavicek's theory that portal blood is poisonous for the blood of the vena cava. While it is true that secondary hemorrhage and heart failure occur now quite rarely during penum after obstetrical operations pulmonary embolism still plays an important part in the cause of death. By means of the elevated position however it is possible to prevent the main cause of embolism, i.e. the thrombosis and thereby to limit considerably the occurrence of mortal embolism.

A report of 38 additional cases of death due to embolism is given in the appendix of the article. Only one of the patients developed thrombosis after the operation while two others already had thrombosis at the time of operation. In the 700 cases observed up to January 9, 1937 from 28 to 98 deaths due to embolism and from 16 to 30 deaths from thrombosis were to be expected but only 3 cases of fatal embolism and no thrombosis whatever were encountered.

(H. H. SCHMID) CLARENCE C. REED M.D.

Craford C. A Preliminary Report on Postoperative Treatment with Heparin as a Preventive of Thrombosis. *Acta chirurg. Scand.* 1937 79: 407

The natural anticoagulant heparin discovered by Howell in 1918 is to be regarded as a suitable experimental medium for counteracting a tendency to thrombosis after an operation. The production of protein free heparin has made possible experimental investigations on patients after operation.

The author reports cases in which heparin was given postoperatively as well as pre-operatively.

So far as any conclusions can be drawn from the experiences gained from these cases it must be admitted that the effect of prolonging the time of

coagulation by means of heparin is, as indeed might be expected, greatly to increase the tendency to bleeding in the area of the operation. This effect was very strikingly illustrated in the first case cited by the author in which the heparin treatment was begun prior to the operation. The same effect, however, has also been clearly demonstrated in cases in which the heparin treatment was not started until after the wound had been sutured.

It would naturally be most effective if the heparin treatment were begun before the operation, as it is not known when a distant thrombus begins to form and it is obviously conceivable, in theory, that a thrombus may already begin to form while the operation is in progress. In view of the above-mentioned tendency toward bleeding, however, such pre-operative treatment is not feasible. It must therefore be considered an advantage to commence the treatment with heparin as soon as possible after the conclusion of the operation. The author proposes, if practicable, in future to begin the treatment three hours after the operation, i.e., as soon as it may be assumed that the physiological hemostatic process is completed and the thrombotic action on the small vessels in the area of the operation has become more or less stabilized. So far as is known, heparin is not capable of dissolving thrombi or coagula, so that there is not likely to be any risk of bleeding after that time has elapsed.

No toxic effect can be ascribed to the employment of heparin in any of the author's cases. An interesting observation, worth pointing out here, was that evidently both larger and more frequent doses of heparin were required postoperatively than in healthy human and animal experimental subjects to obtain the same coagulation-reducing effect.

Only after heparin has been tried out on a very large material will it be possible to draw any definite conclusions concerning its usefulness.

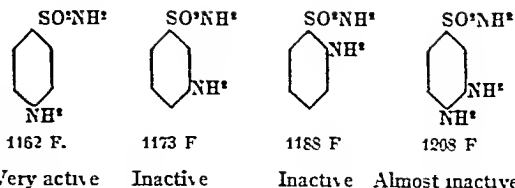
NORMAN C BULLOCK, M D

ANTISEPTIC SURGERY; TREATMENT OF WOUNDS AND INFECTIONS

Tréfouel, J., Tréfouel, Mme. J., Nitti, F., and Boret, D.: The Mode of Action of P-Aminophenylsulfamide and Some Azo Derivatives in Experimental Streptococcal Septicemia (Le mode d'action du p-aminophénylsulfamide et des dérivés azoïques dans les septicémies streptococciques expérimentales). *Presse méd.*, Par., 1937, 45 839.

In the preparation of substances related to prontosil the authors noted that the azo radical, the source of the color, was not responsible for the anti-streptococcal properties of the drug. They have described an extremely active colorless compound, p-aminophenylsulfamide, or 1162 F. The authors' work has been confirmed by Gousselet, Poulain, Colebrook and Kinney, Battle, Long and Bliss, and Rosenthal.

The theory is advanced that substances of the prontosil group act by splitting to release the p-ami-



nophenylsulfamide nucleus. The action of this substance is bacteriostatic both *in vivo* and *in vitro*. The arguments advanced in support of this theory are as follows.

Any shift in the positions of the radicals of the first ring modify the bactericidal activity (see figure).

It has been shown that prontosil is capable of sensitizing a guinea pig when it is injected intracutaneously. If, as the authors suppose, this substance is split in the organism it should give rise to triamino-1-2-4 benzene which should possess the same property. This proves to be the case experimentally. Likewise, animals sensitized to the triamine react to prontosil. On the contrary p-aminophenylsulfamide is devoid of sensitizing properties.

Prontosil is not bactericidal *in vitro* but after it is split it becomes so. Moreover, the blood of animals treated by either prontosil or p-aminophenylsulfamide becomes bactericidal *in vitro*.

ALBERT F. DE GROAT, M D

Doerfler, H.: Erysipelas (Das Erysipel). *Muenchen med Wchnschr.*, 1936, 2 1913.

The cause of erysipelas is always a local infection and spreading of the so-called streptococcus pyogenes in the skin, the same streptococcus which calls forth phlegmonous inflammation and septic infection. The inflammation in the skin appears as a sharply delineated redness in the lymph spaces, and advances until it comes to its spontaneous termination. In the face it appears most often on the nose as a swelling and redness, either with or without chills. The portal of entrance is a small wound around the nasal opening, from nasal catarrh or from an injury, or occasionally a small abrasion behind the ear, or a small scratch on the scalp. The temperature is usually high and without remissions. After from seven to nine days the process comes to a standstill at the neck and the temperature falls. The entire face and scalp are swollen, and where the inflammatory process is subsiding blisters may appear, in places with brown, dried, epidermal crusts. The entire area is painful to the touch. The general symptoms are marked. The teeth lose their luster and become covered with a brown bark-like coating. The tongue is dry. Vomiting and delirium may result from the fever or meningeal irritation.

The majority recover from the disease. In the first days after the fever disappears great care is needed to avoid overexertion of the heart. Patients should not be up too soon.

In the differential diagnosis there are to be considered swelling of one side of the face due to ulcera-

tion of a tooth furuncle of the upper lip or the face inflammation of the parotid gland mumps and edema of the eyelid in a small wound of the face or forehead with crushing and infection of the tissues

Occasionally the cervical and submaxillary lymph nodes suppurate after erysipelas. On the other hand phlegmonous suppurative abscesses are a common occurrence in erysipelas of the extremities. Orbital phlegmon may occur but involvement of the eye itself has not been observed.

Erysipelas of the extremities is varied. There is no definite limit to the spreading process it nearly always reaches as far as the toes. There does not seem to be the same high degree of toxicity in erysipelas of the extremities as in erysipelas of the face. The temperature is not as high and constant and the prognosis is better. In patients without resistance the process may spread over the entire body this is true especially in patients who have been operated upon for cancer.

The differential diagnosis must be made from progressive subcutaneous phlegmon of the subcutaneous cellular tissues and septic thrombosis of the veins of the lower extremities. The former may result from pyogenic infection after minor injuries or it may be caused by blood conditions. There is likewise a high fever and rapid development and spread of redness and swelling of the skin. There is much more pronounced pain on pressure upon the involved areas as well as much greater swelling. There may also be a type of gas edema with crepitation and the presence of air in the subcutaneous tissues. In the cases of septic thrombosis of the arteries and veins there is also redness of the skin but there is a clearly purplish undertone present. A very sick patient may have no pulse in the involved extremity. Often the cord like vessel thrombosis can be palpated in the bicipital groove. The allergic exanthemata which show a variety of configurations in the skin following certain medications or serum injections may also be confused with erysipelas. In these the nettle rash like delineation with its wheal formation and abrupt borders of marked efflorescence together with simultaneous swelling of the lid lip and tongue give the necessary differentiation. Erythematous processes are present almost exclusively on the hands they usually follow skin injuries of cooks and butchers. The condition is absolutely without danger, may be long drawn out but will subside with treatment as well as spontaneously.

The authors did not use erysipelas serum from swine in any of their cases. Ichthyol ointment dressings or swabbing with iodine every second day was sufficient treatment. There is no therapeutic erysipelas serum available. The treatment should be entirely conservative. Often painting a cross stripe of iodine two fingerbreadths wide was sufficient or the use of compresses saturated with a 1 to 1000 sublimate solution renewed 2 or 3 times daily was effective. In the face boracic ointment dressings may be used and the eyes should be irrigated frequently.

One tablet of a grain three times a day or 1 tablespoon of a 15 to 160 solution of pyramidon should be given to the patient every two hours until the fever has gone. An ice pack to the head will combat headaches. For the care of the mouth continuous sucking upon a piece of gauze dipped in 3 per cent cold boric solution is recommended. Alcohol is used also. Prontosil is given intramuscularly daily for several days or two prontosil tablets may be given by mouth three times daily.

There is great danger of transferring the disease to other wounds.

(ERICH HEMPEL) J. DANIEL WILEY, M.D.

ANESTHESIA

Critchley M. Hasler, J. K. Macdonald, A. D. Ferguson, F. R. and Others. Discussion on the Neurological Sequelae of Spinal Anesthesia. *Proc. Roy. Soc. Med.*, Lond. 1937, 30, 1007.

Critchley makes a frank and outspoken attempt to clarify the ill results whatever they may be of spinal anesthesia. He cites headache, abductus palmaris, aseptic meningitis, and lesions of the cauda equina and conus medullaris as the more common untoward sequelae to this anesthesia and illustrates each by appropriate case histories. He also makes note of the fact that symptoms of a latent neurological disease may sometimes be precipitated by spinal anesthesia. He quotes reliable experimental data to prove the effects of the toxic reaction of cocaine derivative injected intrathecally and raises several well chosen questions as to the possible basic cause of the ill results in many cases of spinal anesthesia.

Hasler outlines the technique of administration of spinal anesthesia. The matter of the type and size of needle position of the patient the introduction of the solution, and the chemical properties of it and the question of the proper concentration of solution are dealt with briefly. He is obviously and as he tells us an anesthetist and his outlook is optimistic.

Macdonald discusses the pharmacologist's experiences with spinal anesthesia and presents considerable detailed data on animal experimentation. He believes that in attacking the problem of the ill effects of intrathecal drugs one should remember Sherrington's proof that changes in the nervous system are more easily produced at the nerve cells and synapses than in the actual nerve fiber and Closser's findings that of nerve fibers the smallest in cross section are the most susceptible to the action of cocaine and its derivatives.

Ferguson looks gloomily on the fact that the sequelae of spinal anesthesia today are as damaging as they were many years ago. He recognizes epidural persistent headache and sixth nerve palsies but he is particularly impressed by the unfortunate results of lesions of the cauda equina and remarks that such sequelae are vastly more devastating than the majority of post anesthetic chest complications. He

presents a strong argument to discredit the part supposed by some to be played by trauma from the needle or hemorrhage, he believes that the damage is done by too heavy an anesthesia, too high a concentration, and poor operative technique, such as too rapid injection

Myelomalacia is suggested by Brain as a possible result of spinal anesthesia, and he presents a case of this disease in a young man who, under spinal anesthesia, was operated upon on September 3, 1934, for a displaced semilunar cartilage, and died December 24, 1934. The autopsy findings were definitely those of massive softening of the cord, which was maximal in the lumbar area

The pathological report of Brain's case by Russell mentions no evidence of cord trauma or old hemorrhage, bacterial infection, or meningitis. It is Russell's opinion that in this case the anesthetic, spino-cain, having no direct necrosing effect upon the arteries, most probably exerted a destructive effect on the spinal cord through a process of "hyperallergic arterial necrosis" and endoplebitis

Ashworth divides the sequelæ of spinal anesthesia into two groups, those dangerous to the patient, as cauda equina lesions, and those transient, such as palsy of the sixth nerve and headache. He believes the basis of postanesthetic headache to be truly organic

Harris believes that the action of concentrated novocain on the nerve fibers is negligible, inasmuch as he had injected the sciatic nerve with from 2 to 5 per cent novocain solution with no more than an anesthesia, foot drop, or numbness, never lasting more than an hour. He believes the ill effects in Ferguson's cases to be due to a sacromyelitis effect, vasoconstrictor or thrombotic accidents

Martin briefly mentions a case he had seen in which an ascending myelitis, and eventually encephalomyelitis, occurred following spinal anesthesia.

JOHN MARTIN, M D

Philippides: A Simplified Method of Controllable Girdle Spinal Anesthesia (Ein vereinfachtes Verfahren der guertelfoermigen einstellbaren Spinalanæsthesie) *61 Tag d deutsch Ges f Chir*, Berlin, 1937

In contradistinction to the original Kirschner method, in which, by the injection of air into the patient placed in the Trendelenburg position, the lumbar and sacral roots were protected from the effect of the anesthetic, and with an increase of the amount of the injected air the anesthetic is driven as far cephalad as desired, the present method of control of the Kirschner percain mass is obtained by removing a variable amount of cerebrospinal fluid. As a result the lumbar portion of the dural sac is rendered free from cerebrospinal fluid. The nerve roots which are not bathed with spinal fluid are also not touched by the anesthetic, since the latter takes its place at the height of the cerebrospinal-fluid level. In this manner a girdle-like anesthesia is obtained while the extremities remain completely free. The control of

the level of the anesthetic belt is obtained by changing the height of the puncture and the amount of cerebrospinal fluid which is removed. The more fluid that is removed and the more cranially puncture is made, the larger the region emptied of cerebrospinal fluid becomes and the higher the anesthetic mass places itself. One quarter per cent of the Kirschner percain mass is used as the anesthetic. Aside from the Kirschner puncture needle no special instruments are necessary. In the technique the following procedure is used:

With the patient in a Trendelenburg position between 25 and 30 degrees, enough fluid is removed until at the removal of the syringe no more fluid is obtained, or until a negative pressure has been produced in the dural sac. Then from 1½ to 2 c cm. of the anesthetic solution are injected and about 2 c cm of air are injected immediately after. After five minutes have elapsed the height of the anesthesia is tested, and if it is believed necessary to strengthen the anesthesia and drive the anesthetic zone higher, another ½ c cm of the anesthetic is injected and then 2 c cm. of air. The dosage, therefore, is administered fractionally. The needle, to which a small caliber rubber tube is attached, is closed by a stopper after the injection is completed. In high anesthetics the puncture is made between the eleventh and twelfth thoracic vertebrae, in anesthetics of the lower abdomen between the twelfth thoracic and the first lumbar vertebrae. The amount of fluid withdrawn varies between 15 and 30 c cm. In anesthetics intended for the legs the injection is made between the second and third lumbar vertebrae. At the most only 15 c cm of cerebrospinal fluid are withdrawn. For saddle anesthesia the puncture is made between the third and fourth lumbar vertebrae. About 5 c cm. of spinal fluid are withdrawn and the anesthetic is injected

The advantages of this method of anesthesia are:

- 1 The ascension of the specifically lighter anesthetic towards the head is not possible
- 2 An overdose or underdose is prevented by the fractionated administration
3. Good anesthesia is obtainable even with relatively small amounts of percain, from 3.5 to 3.6 mgs. Even in high anesthetics more than 7.5 mgs was not necessary

4. The elimination of an excessive drop in the blood pressure is obtained

- 5 The technique is simple and the anesthesia is obtained rapidly. After fifteen minutes, at the latest, the operation can be started.

For the pre-operative preparation from 0.04 to 0.05 ephedrin is given intravenously a few minutes before the injection is undertaken

In the discussion Kirschner defends the procedure for obtaining the girdle-like spinal anesthesia, as suggested by him, against the frequently repeated objection that it is too cumbersome. The procedure is, on the contrary, very simple at the present time because of the laudable cooperation of Philippides. It does not require any special anesthetist, since the

physician who administers the spinal anesthesia can prepare himself for the operation while the anesthetic is developing its effect. Only one observer is required to remain with the patient. Since the anesthesia lasts for a long time and at the first becomes deeper it does not matter if the patient is forced to wait ten or twenty minutes before the operation after the anesthesia has taken effect. Therefore, no loss of time results either in the course of a single operation, or in the course of a large operative schedule. For the administration of the spinal anesthesia a simple record syringe suffices, the earlier special double syringe is no longer required. The results obtained up until now with this type of spinal anesthesia in more than 3,750 of the author's own cases, and according to the reports in the literature are uniformly good. No other procedure for the elimination of pain which can give similar good services in major abdominal surgery in seriously ill patients and in difficult operative procedures is known.

HARRY A. SALDMANN, M.D.

SURGICAL INSTRUMENTS AND APPARATUS

Masmonelli F. A Surgical Suite with Sterilizable Operating Rooms (Bloc chirurgical à cellules opératoires stérilisables). *Bull et mém Soc de chirurgiens de Par*, 1931, 29: 147.

Research has shown that micro organisms can constantly be recovered from the air circulating in operating rooms and if perfect sterility is to be obtained other methods must be used to prevent contamination than protective coverings over instrument tables. Chemical sterilization by formalin has the disadvantage of requiring considerable time as well as leaving objectionable fumes. Neutralizing formalin vapor with ammonia salts is very destructive to walls and metal fixtures. Filtered air com-

bined with ultraviolet irradiation has been used effectively by Trénel in Vienna.

The operating suite described in this article will be placed in use at the Landy Clinic. Sterilization of the operating rooms is effected by introducing water vapor under pressure at 120° C. This is removed by a ventilator which completes filtration of the air by withdrawing the mist. The rooms are oval to eliminate corners, radiators are situated between double walls, all sterilizers are outside the room and outlets are provided in the walls for all electrical equipment. Only the surgeon and his necessary aides are allowed in the operating room. The secretary has headquarters in an air-conditioned ante room behind a glass partition so that communication by signals or a microphone may be maintained. Solar irradiation from the ceiling is reconstructed by a combination of infra red and ultraviolet lights and is centered upon the operating table.

The 'scrub-up' room is in the center of the suite so that the surgeon has a clear view of the operating rooms and sterilizing rooms. An ultraviolet light in the ceiling irradiates the operators during the time they are changing to operating garb and scrubbing.

The anesthetic room is also irradiated by ultraviolet light and only the anesthetist is allowed to come into the operating room with the patient.

Air conditioning maintains a constant flow of filtered air at proper temperature to all the rooms of the operating suite as well as to glass enclosed visitors galleries. Moisture on the windows and glass ceilings is eliminated by the air conditioning.

Sterilized material is received into a special 'sterile' room directly from the autoclaves so that there is no contact with soiled or contaminated linen which is placed in the autoclave through the opposite end of the sterilizer from another room.

MARSH W. POOLE, M.D.

PHYSICO-CHEMICAL METHODS IN SURGERY

ROENTGENOLOGY

Rintelen, G : Arteriography as a Diagnostic and Therapeutic Medium (Die Arteriographie als diagnostisches und therapeutisches Hilfsmittel) *Zentralbl f Chir*, 1937, 615.

Thorium dioxide, or Heyden's thorotrast, is considered to be suitable for diagnosis and therapeutics, as it most readily fills the demand that such a medium must not injure the vessels, the circulation, nor the entire organism, and must give good shadows in strong dilution. The misgivings formerly expressed, that thorotrast may become deposited in the reticulo-endothelial system and there act injuriously, are refuted by the evidence that its radio-activity could hardly come into question in the dosage used. Furthermore, thorotrast has the advantage of causing absolutely no pain upon injection.

The artery to be injected is exposed for a short distance. The average rapidity of injection should be about 3 c.cm. per second in order to obtain good pictures. After the administration of about two-thirds of the amount the roentgenogram is made. With successful exposures, filling defects in the vascular walls and uniform changes in the diameter of the vessels are recognizable, and valuable information as to the number and extent of the collaterals is obtained. According to the view of Rintelen, aggravations of an existing gangrene of an extremity can occur only when the affected extremity would have to be amputated anyway. In contradiction to the mentioned demands, a painful vascular spasm of the main artery may occur in persons with a labile vascular system. This spasm results in a marked dilatation of the entire capillary and venous system. The author makes this assumption in two cases, in which roentgenography was not successful. The experience, that in one-third of the cases, which were affected with endarteritis, spasms and calcification, considerable improvement had set in after the injection and in some cases lasted for years, is also said to have been seen in other clinics.

(PLENZ) LOUIS NEUWELT, M D

Mazzetti, M. The Radiographic Appearance of the Thorax in the Vertical Inverse Position in Normal and in Some Pathological Conditions (L'immagine radiografica del torace in posizione verticale inversa in condizioni normali e in alcune contingenze patologiche) *Radiol med*, 1937, 24 459

The influence of the inverse position, the complete opposite of the erect, on the thoracic organs has been studied by a few French and Italian workers in normal chests and in cases of pleurisy associated with pneumothorax, and to demonstrate the origin of some deformities of the diaphragm. As Mazzetti knows of no other researches on the subject, he carried out comparative studies in the erect

and, immediately afterward, in the inverse position in a series of thirty subjects, composed of normal persons and tuberculous patients, including some who had had a pneumothorax or phrenicotomy. A perfectly vertical inverse position without muscular tension was obtained by strapping the subject to a tilting table. Ten illustrative cases are reported in full, with roentgenograms. The findings were as follows.

In the inverse position, the ribs show a marked diminution of the inclination of the costal on the horizontal plane, with a rise of their anterior extremities and of the sternum. These changes are probably due entirely to a fall of the most mobile part of the thoracic cage toward the cephalic pole.

In the lungs, both normal and pathological, there is a noteworthy accentuation of the markings, as a result of stasis in the lesser circulation. In fact, the inverse position is the best one for demonstration of the vessels. The hilar shadows of the pulmonary artery appear. The upper part of the lung becomes less transparent and the lower more so.

In general, all tuberculous shadows are accentuated and enlarged, but their outlines are less clear. The nature of a small suspected focus, scarcely evident in the erect position, may be confirmed. Bronchopneumonic areas are darker and more homogeneous. The walls of cavities are thickened and blurred, and the tissue between them is less transparent. Calcified glands are unchanged, while in some cases glands of considerable size, not seen in the erect position, are revealed.

In elective pneumothorax of the upper lobes, there is a partial reexpansion of the collapsed area as the gas migrates in part toward the base, where it produces collapse of the corresponding part of the lung. The gaseous zone may show slight opacity, probably due to circulatory stasis in the parietal pleura or the soft tissues. The pathological shadows in the collapsed lung become sharper. The descent of the lung often obscures adhesions visible in the erect position.

In hydropneumothorax, the fluid is dislocated toward the apex where it becomes stratified with a reversed horizontal level. The base of the lung and the pleural lesions become visible.

After phrenicotomy, the only characteristic appearance is an increased dislocation of the paralyzed diaphragm toward the apex.

In both normal and pathological cases the height of the lung is decreased because of the fall of the diaphragm toward the apices.

The heart undergoes striking and constant changes. It shows an eccentric dilatation of all its cavities, assuming the shape of the mitral heart. The right and left inferior and the left median curves are accentuated. The apex is dislocated upward. The great vessels are dilated. The superior vena cava is

physician who administers the spinal anesthesia can prepare himself for the operation while the anesthetic is developing its effect. Only one observer is required to remain with the patient. Since the anesthesia lasts for a long time and at the first becomes deeper, it does not matter if the patient is forced to wait ten or twenty minutes before the operation after the anesthesia has taken effect. Therefore no loss of time results either in the course of a single operation or in the course of a large operative schedule. For the administration of the spinal anesthesia a simple record syringe suffices; the earlier special double syringe is no longer required. The results obtained up until now with this type of spinal anesthesia in more than 3,750 of the author's own cases and according to the reports in the literature are uniformly good. No other procedure for the elimination of pain which can give similar good services in major abdominal surgery in seriously ill patients and in difficult operative procedures is known.

HARRY A. SALZMANN, M.D.

SURGICAL INSTRUMENTS AND APPARATUS

Masmontell, F. A Surgical Suite with Sterilizable Operating Rooms (Bloc chirurgical à cellules opératoires stérilisables). *Bull et mém Soc de chirurgiens de Par* 1937 29 147.

Research has shown that micro-organisms can constantly be recovered from the air circulating in operating rooms and if perfect sterility is to be obtained other methods must be used to prevent contamination than protective coverings over instrument tables. Chemical sterilization by formalin has the disadvantage of requiring considerable time as well as leaving objectionable fumes. Neutralizing formalin vapor with ammonia salts is very destructive to walls and metal fixtures. Filtered air com-

bined with ultraviolet irradiation has been used effectively by Trénel in Vienna.

The operating suite described in this article will be placed in use at the Landy Clinic. Sterilization of the operating rooms is effected by introducing water vapor under pressure at 120° C. This is removed by a ventilator which completes filtration of the air by withdrawing the mist. The rooms are oval to eliminate corners, radiators are situated between double walls, all sterilizers are outside the room and outlets are provided in the walls for all electrical equipment. Only the surgeon and his necessary aides are allowed in the operating room. The secretary has headquarters in an air-conditioned ante room behind a glass partition so that communication by signals or a microphone may be maintained. Solar irradiation from the ceiling is reconstructed by a combination of infra red and ultraviolet lights and is centered upon the operating table.

The 'scrub up' room is in the center of the suite so that the surgeon has a clear view of the operating rooms and sterilizing rooms. An ultraviolet light in the ceiling irradiates the operators during the time they are changing to operating gath and scrubbing.

The anesthetic room is also irradiated by ultraviolet light and only the anesthetist is allowed to come into the operating room with the patient.

Air conditioning maintains a constant flow of filtered air at proper temperature to all the rooms of the operating suite as well as to glass-enclosed visitors galleries. Moisture on the windows and glass ceilings is eliminated by the air conditioning.

Sterilized material is received into a special 'sterile' room directly from the autoclaves so that there is no contact with soiled or contaminated linen which is placed in the autoclave through the opposite end of the sterilizer from another room.

MARSH W. FOGLE, M.D.

periods produced much milder reactions. At intervals longer than thirty minutes post mortem, the cells scarcely reacted to radium or x-rays, from which fact the author draws conclusions as to the mechanism of the biological action of radiations.

The author investigated the question whether latent radiolesions would appear when the tissues were put under conditions favorable to artificial life and activation, even minimal, of their metabolism, i.e., immersion in Ringer-Locke solution for forty-eight hours at room temperature. Slightly hypotonic or hypertonic solutions brought out more marked changes in the irradiated tissues than in the controls. The solution probably revealed a latent alteration in permeability of the cadaveric cell membrane, aggravated by irradiation.

The main general conclusions from these experiments are not the cadaver *per se*, but dead cells, or those still living although incapable of reaction are indifferent to radiations.

Radiations differ from other physical or chemical agents having a caustic action, in that the latter act passively, while the radiolesion is a vital active phenomenon. The action of radiations on living matter is physical and of the same nature as on inorganic matter, but living substances react with a train of special phenomena which do not represent simply the transformed physical agent.

Radiosensitivity has a relation not only to the life of the cell but also to the degree of its metabolism. So far as it is revealed through a radiolesion, it implies not only the presence of radiolabile physicochemical structures, but also a metabolism suffi-

ciently active so that the physical stimulus can be elaborated and reveal its biological effect. It is therefore more exact to speak of radiosensitivity in terms of time as a function of metabolism, rather than as an attribute of certain species of cells. The action of radiations is indirect, and the cytoplasm appears to be at least as important as the nucleus in determining sensitivity.

The fact that radiations cannot produce a caustic effect in the cadaver proves that their action differs from that of true caustics, which can cause lesions in both the living and the dead. The caustic reaction to radiations is an active necrobiosis produced by the selective action of the soft and corpuscular rays, and it is an evolution of the mass reaction. By correct dilution the selective reaction can be obtained with the same infrapenetrating rays; therefore it is not due to the peculiarity of a definite physical agent, but rather to a biological property of certain groups of cells. This is demonstrated decisively by the selective skin reaction produced in the agonal stage by infrapenetrating radium rays, and also by the disappearance of the selective reaction very soon after death, while diffusely distributed radiolesions persist longer.

These researches may possibly be developed so as to have medicolegal importance for verification of real or apparent death, or, within certain limits, for determination of the time of death.

The rays which appear to have the greatest effect on surviving cells are the primary β and γ .

The article is supplemented by microphotographs and a bibliography.

M. E. MORSE, M.D.

seen clearly, and sometimes also the inferior. The status in the pulmonary circulation is secondary to a difficult outflow from the left ventricle and a facilitated inflow from the greater circulation.

French and Italian references are given

M E MORSE, M D

Rocher Radiographic and Radioscopic Control During Operation in a Room Illuminated by a Helium Lamp (*Contrôle radiographique et radioscopique intra opératoire en salle éclairée par la lampe à hélium*) *Mém Acad de chir, Par* 1937 63 667

Rocher notes that it is often desirable to have radiological control of certain operative procedures during operation; this is especially true in orthopedic surgery. Various methods have been proposed to accomplish this purpose without interfering with the proper lighting of the operative field.

In studying this question at the Children's Hospital at Bordeaux it was found that this could best be accomplished by using a monochromatic helium lamp. For radioscopic control a Dymix glass is superimposed on the fluoroscopic screen, a helium lamp is used with two glass filters: one a

Cataviol which absorbs the rays on the violet side of the spectrum and the other movable called an 'M C B', which absorbs the rays on the red side so that the resulting light contains only the yellow or monochromatic rays. The Dymix glass over the fluoroscopic screen absorbs these rays, so that the screen is sufficiently darkened to show the shadows clearly.

This light gives sufficient illumination of the operative field and not only permits fluoroscopic control as described but also is sufficiently non-actinic with the use of the 'M C B' filter to permit the development of the radiographic films without removing them from the operating room. The lamp is placed 3 m. from the operating table and 4 m. from the developing apparatus. The usual developing bath is used and the film is then placed in acetic acid. It is examined by reflected light in the negative. The helium light can thus be used for operation, fluoroscopy and radiography. It may be used for control of fracture work, localization of metallic foreign bodies and also for fluoroscopic study of the viscera with opaque media. ALICE M. MIREUX

RADIUM

Mayneord W V and Roberts J E. An Attempt at Precision Measurements of Gamma Rays *Brit J Radiol* 1937 10 365

This article is a detailed technical account of the measurements of the ionization produced in air by radium sources. Its contents however are of great interest to the clinical radiologist, since an attempt is now being made to express dosage in radium therapy in the unit of x ray quantity which is the international roentgen (r). In this manner all types of radiation therapy, low voltage x ray

therapy, deep x ray therapy, the more recent super voltage x ray therapy, telecurie therapy and contact radium therapy could be linked together through the same fundamental dosage unit.

In the first half of the article the authors discuss at some length the problems which may interfere with the proper experimental realization of the r unit. Among these are the configuration of the measuring ionization chamber, whether parallel plate or 'air wall' chamber, the secondary scattered radiation from the walls of the chamber, the secondary electromagnetic radiation from the walls of the room, the finite size of chamber and source and the atomic number of walls of the chamber.

In the second half a carefully standardized measuring system is presented. It includes a general description of the apparatus, consideration of the stray ionization in the system, a discussion of various types of chambers such as carbon magnesium air wall and paraffin wax chambers, the study of the applicability of the inverse square law, the question of accurate measurement of the various radium sources, especially as it concerns the errors resulting from the use of different chambers and finally some experiments with radon seeds.

The conclusion is reached that the total charge set free per cubic centimeter of air at normal temperature and pressure at 1 cm distance from a point source of 1 mg radium element filtered with 0.5 mm platinum amounts to 8.3 electrostatic units per hour. In other words 8.3 is the most probable value of the cmhg (1 cm distance 1 mg Ra element 1 hour exposure) radium unit as expressed in roentgens (r). T. LECOTIA, M D

MISCELLANEOUS

Faltrieri G. Radiobiology and Radiothanatology (*Radiobiologia e radiotanatologia*) *Radiol med* 1937 24 367

Faltrieri reviews the present status of radiothanatology and reports experiments in this field which throw light on certain concepts of radiobiology. These researches were based on radium and x ray irradiation of the skin of patients *en extremis* and on subjects at various intervals after death.

In the agonal period irradiation produced histologically a typical selective reaction, a finding which is important for a clearer definition of the nature of caustic mass and selective reactions. Ten minutes after death the selective reaction with the use of β and γ rays had disappeared and was replaced by shrinkage of the cells in all layers, pyknosis of the nuclei and perinuclear changes in the spinous and germinal layers. Half an hour after death there was an inversion of the radiolesion, i.e. swelling of the cells with displacement of the nuclei to the periphery or of the chromatin to one sector of the nucleus. This reaction is probably connected with changes in osmotic pressure due to arrest of the circulation and metabolism. Irradiation with high dosages of unfiltered x rays 60 H, at the same time

period, by progressive tender diffuse swelling of the distal phalanx without other evidence of infection. Roentgenograms reveal a central expanding cystic lesion of the terminal phalanx. At operation a cyst which is easily peeled away from the bone is found. This cyst contains sebaceous material and is lined by squamous epithelium. The lesion is benign, but recurrences follow if removal is incomplete. It is not clinically nor roentgenologically possible to differentiate this type of cyst from solitary bone cyst or chondroma.

The authors also report another case of subcutaneous squamous epithelial cyst with beginning erosion of the phalanx. This, they believe, illustrates an early stage of a squamous epithelial bone cyst.

HARVEY S. ALLEN, M.D.

Dublin, L. I.: Statistics on Morbidity and Mortality from Cancer in the United States. *Am J Cancer*, 1937, 29 736

Cancer is a major public health problem in the United States. Malignant diseases are responsible for about 150,000 deaths a year in this country. In the registers of mortality, cancer is outranked in numerical importance only by heart disease. Of initial groups of 100 white persons at birth, 10 males and 13 females will eventually die from some form of cancer under present conditions.

The following is a summary of the highlights on cancer presented by the Industrial Department of the Metropolitan Life Insurance Company.

Cancer is second in the list of causes of death. Twenty-five years ago it was in seventh place. This change in position is due primarily to a decline in the death rate of the other diseases.

The death rate from cancer in the last twenty-five years rose 14.5 per cent, from 73.8 per 100,000 in 1911, to 86.8 per 100,000 in 1935. These rates are standardized for age, sex, and color. Practically all of the recorded increase in cancer mortality occurred in males; the mortality from cancer in white females declined slightly during this period.

For the twenty-five-year period, the average death rate of white females was almost 20 per cent higher than that of white males. In more recent years, however, the rise in the male rate has tended to wipe out the difference. In recent years, the excess female over male mortality in white persons has been limited to the ages between twenty-five and fifty-four years, beyond these ages a considerably higher death rate is found in males than in females.

The cancer mortality of colored females exceeds that of white females, however, the cancer mortality of white males is one and one-half times that of colored males.

An analysis of the mortality from cancer by organ, or part affected, shows that 50 per cent of the fatal cancers were located in the digestive tract. Cancers of the female breast and genital organs accounted for approximately 30 per cent, while those of the skin and other organs made up the remaining 20 per cent.

The figures vary, however, with the sex. Cancers of the genital organs were responsible for 28 per cent, and cancers of the breast for 15 per cent of the reported deaths from cancer in white females. In the white males about 8 per cent of the fatal cancers occurred in the buccal cavity and 3 per cent in the skin. In females these forms play a very small part.

The increases in the death rate from cancer are practically limited to males, but in white males the increases in the recorded death rates were sizable only after the age of fifty-five years. In colored males the trend was significantly upward after the age of thirty-five. Too much emphasis must not be placed upon this finding in view of the great improvement which has taken place in the recording of causes of death among colored people in recent years.

In white females such increases as appear are limited to the ages after sixty-five. In the age period from thirty-five to fifty-four, the trend of the death rate was definitely downward.

The recorded death rates from cancer of the stomach, liver, and gall bladder are materially higher for males than for females. For white females the trend of the death rate for these forms of cancer has been downward continuously, for white males no definite upward or downward trend is evident for the twenty-five-year period.

A definitely increasing death rate from cancer of the peritoneum, intestines, and rectum is evident in each of the colored sex groups. In recent years the mortality of white males exceeded that of white females, which reverses the sex ratio of prior years.

The mortality from cancer of the female genital organs is about 50 per cent higher in colored females than in white females. The death rate of white females decreased significantly at all ages combined and for several of the age periods.

In contrast to the trend of mortality from cancer of the genital organs, the death rate from cancer of the breast has increased. A good part of the increase is due to the rise since 1930.

Cancer of the buccal cavity is about seven times as frequent in white males as in white females. The trend of the death rate for this site had been downward.

Cancer of the skin is relatively rare among colored persons. Males show a higher death rate than females. The mortality from skin cancer declined significantly in both white males and white females.

Cancers included under the residual title "cancers of other and unspecified organs" showed a sharp upward trend. In this group the data available for some of the sites, the lung and the pleura, the pancreas, and the prostate, show significant increases in the death rates.

The difference in the trends by sex is to be viewed in the light of the fact that about four-fifths of the cancers among males, but only one-half of the cancers among females, occur in inaccessible sites. Therefore, improvements in diagnosis over the twenty-five-year period due to increased hospital-

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Teschendorf H J Hand Schueller Christian Disease Lipogranulomatosis (Die Hand Schueller Christiansche Krankheit Lipogranulomatose) *Ergebn d med Strahlenforsch*, 1936 7 43

The characteristic symptom triad of geographic skull, exophthalmos, and diabetes insipidus occurs in only a small part of the cases of Hand Schueller Christian disease. The diagnosis is made difficult by the fact that the two latter symptoms may be absent, and bony changes may occur only in other parts of the skeleton instead of the skull. The specific lipogranulomatous changes may appear in all the organs of the body. The disease most often attacks children up to the age of ten years. The most frequent early symptoms are diseases of the teeth and gums and changes in the skin and auditory organs. The changes in the eyes are due to lipogranulomatous proliferations in the orbits or perforation of such proliferations originating in the dura and exophthalmos usually asymmetrical with dislocations of the bulbus and paralyses of the ocular muscles as in tumor of the orbit without changes in the background of the eye. The auditory organs are often affected by mastoiditis and otitis. The mouth and teeth present strikingly painless swellings and hemorrhages ulcerations loss of teeth and light areas in the structure of the maxilla. The skin shows eczematous phenomena with xanthomatous deposits. Of special importance in the inner organs is the lymphogranulomatosis of the lungs which presents two stages: fine floccular stippling from focal proliferations in the alveoli and interstitial tissue and handlike thickenings the fibrous stage of healing. In the nervous system basic symptoms rarely occur in spite of the most frequent involvement of the dura next to the skeleton but on the other hand there are numerous neurological phenomena as the result of infiltrations of the brain and spinal cord with the lymphogranulomatous tissue. There is no characteristic blood picture but in the generalized stage there is the picture of a severe secondary anemia frequently a leucocytosis but never a leucopenia. There are no diagnostically applicable metabolic disturbances. In the skeleton, the flat bones or skull calotte are attacked preferably. Lymphogranulomatous foci round or oval, with sharp edges close together with small or extensive defects (geographic skull) appear. This picture is called the geographic skull and is characterized roentgenologically by sharp eburnated thickening edges without demineralization of the adjacent areas.

The disease can be differentially diagnosed from myeloma by the absence of the clerotic edges more diffuse disease of the calvarium and atrophy of the

adjacent areas also the presence of Bence Jones albuminous bodies from chloroma by the myeloid blood changes, from metastatic malignant tumors by the absence of the thickening edges and from osteitis fibrosa cystica by possible hypercalcaemia.

The pathologic anatomical characteristic finding is the existence next to each other of large foam cells and exudate cells containing precipitated lipoids which surround the former but may also appear alone in the form of granulomas in which Sternberg like giant cells may appear. While in the first case the sulphur yellow discoloration suggests lymphogranulomatosis with the predominance of the granulomatous new formation this discoloration is covered and appears more brownish from the blood pigments. The histological picture is obliterated by strands of young or cicatrizing bands of connective tissue. The marked changes in all the organs are produced less by lipid infiltrations into the reticulo-endothelium than by the destructive growth of the granulomas.

The author considers the disease as a disturbance of lipid metabolism which leads to the deposition of cholesterol and lipoids primarily into the reticulo-endothelium. There probably is a secondary formation of granulomas therefore the name lipo-granulomatosis is proposed. This disease is to be differentiated from the other xanthomatoses such as Gaucher's disease and Niemann-Pick disease which also follow a hereditary disturbance of the lipid metabolism by the development of granulomas. Except for the severe cases occurring in early childhood lymphogranulomatosis is amenable to spontaneous healing. A considerably quicker local result is obtained with irradiation therapy, especially roentgen therapy of from 150 to 200 r with a screen of from 0.8 to 1 mm of copper given every second day together with a diet poor in cholesterol and prohibiting meat eggs milk and milk products and animal fats.

(STEVENS) LOUIS NELWEL M.D.

Bissell A D and Brunschwig A Squamous Epithelial Bone Cysts of the Terminal Phalanx and Benign Subungual Squamous Epithelial Tumor of the Finger *J Am Med Ass* 1937 108 1701

The authors report two cases of squamous epithelial bone cysts of the terminal phalanx. Only four other cases of this condition have been reported in the literature. Squamous epithelial bone cysts of the subcutaneous tissues of the hands have been described frequently.

The authors believe that traumatic deep implantation of a fragment of cutaneous epithelium rather than the displacement of embryonic rests is the cause of such cysts. Usually traumatism to the distal portion of the finger is followed after a varying

HOSPITALS; MEDICAL EDUCATION AND HISTORY

Millar, W. M.: La Mettrie. *Surgery*, 1937, 1 623

Julien de la Mettrie, the Father of Materialism, was a weird mingling of many emotions and ideas, and "no small cypher in the ranks of the Asclepiadae." He attempted single-handed to change the prevalent religious and philosophical ideas of his age.

The famous materialist was born in St. Malo on Christmas Day, 1709, six years before the death of Louis XIV. The young lad was a facile talker, and hopes were entertained by his parents that their son would enter the church. To this end, the growing hoy was sent first to the school of Coutances, where he soon won prizes in rhetoric. Thence he proceeded to Plessis in Paris to study logic, and it was here that the youth came under the magnetic spell of one of the professors, Cordier. The latter was a nationally known Jansenist, a member of an intense, fanatical, religious sect. From Plessis the young student went to Harcourt for a course of "natural philosophy." It was about this time that La Mettrie began to turn back from his ideas of becoming a priest and turned to medicine. In this step he was undoubtedly influenced by Hunauld, the village physician, whom La Mettrie greatly admired and respected. Specific training, more than one would get by attending the daily rounds of a small-town practice, was thought advisable. Doubtless on the advice of his friend, La Mettrie, went off to the medical school at Reims, which was one of the best in the century. Here in 1728, the ex-theological student obtained his "bonnet de docteur." He was now nineteen years of age, still too young to practice, and, as was the fashion of his day, the young doctor proceeded to Leyden, the University of the great Boerhaave, then the leading medical man of the world.

Back to St. Malo came the twenty-four-year-old physician full of ideas, with one of the best theoretical professional educations possible for his time, to plunge into the sorrows and griefs of a general practice. The ex-student's mind lingered with the academic, and he had no desire to lapse into marmoreal dullness. He found time to translate Boerhaave and, with the bland egotism of youth, even to compose a brochure on practical medicine. Hunauld died shortly after his assistant returned. Instead of settling down and huddling up a safe and lucrative practice, as any unimaginative man would have been glad to do, the ambitious La Mettrie suddenly, after three years in the tiny village, gave up his place and set off for Paris. In this city, the country doctor apparently had enough influence to secure a commission as medical officer with the French Guards, chiefly through the benevolence of Morand, the surgeon to the Invalides and the Duc de Grammont.

La Mettrie was in the prime of his life when the Silesian Wars between Maria Theresa and France

began, and his regiment was moved to the East. The Army soon saw active service. However, the young officer was stricken with a severe fever. During his convalescence, the sick man began to think about the soul, about life, and their causal relations, ideas which were soon to find formal expression in his books.

One of the first of the young author's works, written in St. Malo, was his *Observations de Médecine pratique*, which was followed in 1735 by a translation of Boerhaave's *L'Aphrodisiacus*, to which he added a few comments and observations of his own on the nature of venereal diseases. A year later, Astruc, of Paris, published his *De Morbus Venereis*, in which he spoke appreciatively of the work of the young man, but also called attention to several errors of translation that had been made. In 1737, the Breton's *Traité du Verlige* appeared, and, in 1739, his *Nouveau Traité des Maladies Vénériennes* appeared. Astruc still took occasion to "sharpshoot", and criticize the works of his rival. Rapidly numerous lampoons and satirical papers appeared throughout France which were insultingly frank and which seared with the branding iron of caricature. Many of these were purported to come from La Mettrie, and some of them doubtlessly did. In them the entire Parisian medical profession was ridiculed. Almost no one was spared, least of all Astruc. This war of pen and pamphlets was stopped perforce for a period when the Guards moved off to war, but once the Frenchman was back to barrack life, his urge to write seized him again. It was soon after his appointment as Medical Chief of half a dozen hospitals that the army officer really drew fire from almost everyone. This time not only were the medicos opposed to him for the very obvious insults leveled at them, but in a very short time the Roman Catholic Church, the several Protestant Churches, and the French Throne arose against this defiant author. The reason was principally his *Natural History of the Soul*, which was shortly followed by other hooks of even more materialistic and apparently more atheistic persuasion. At any rate, all of them aroused tremendous bitterness and feeling against their creator.

These volumes were immediately condemned, first by the army chaplains, and then by the high church authorities in the Index Expurgationes. So much pressure was brought to bear on La Mettrie that he was forced to resign from the Army and flee to Leyden. Even here he was not safe. Again at night, on foot, and in secrecy, the hunted author was obliged to leave this city. The brilliant, caustic man was at the end of his resources until his compatriot Maupertuis took occasion to speak to Frederick the Great about him, and the soldier-philosopher was formally invited to come to Berlin. This the outcast was happy to do and, in 1738, was personally received by the cordial King, who immediately made him a reader and pensioned him with enough money for his immediate needs. Once more there was time to write, and directly there appeared

ization more skilled surgical treatment more post mortem examinations and improved diagnostic procedures, would tend to raise the recorded mortality for males more than for females. In general cancers in inaccessible sites show a rise in their mortality whereas those in accessible sites exhibit a downward trend.

The cancer situation in the United States is far from alarming although much can be done to improve it. The research education and facilities for diagnosis and treatment are encouraging. In three years the American College of Surgeons registered almost 25,000 persons who were cured of cancer. There are already about 200 cancer centers throughout the country which meet the standards of equipment and personnel established by this College.

JOSEPH K. NARAT, M.D.

Bernard F. and Koehler K. Carcinoma Diagnosis by Determination of Lipase in the Blood Serum and Fuchs's Carcinoma Reaction (Die Carcinomdiagnose durch Lipasebestimmung im Blutserum und die Carcinomreaktion nach Fuchs). *Deutsche Zeitschrift für Chirurgie* 1936 248: 72.

On the basis of their researches on a large cancer material the authors came to the following conclusions:

There is frequently an increase in atoxyl resistant lipase in the blood serum in carcinoma. After operative removal of the carcinoma the increase in atoxyl resistant lipase subsides and if the removal has been radical the quantity becomes normal after a time. In all general injuries the atoxyl resistant lipase and the total lipase diminish. In 313 definitely diagnosed carcinomas the authors found an increase of atoxyl resistant lipase 219 times, a decrease 62 times and normal values 32 times. In carcinoma of the skin, the breast and the rectum lipase determination has a high diagnostic value. In carcinoma of the stomach, pancreas and particularly of the biliary tract its value is less. In carcinoma of the prostate, bladder, esophagus and bronchi also there is an increase in the atoxyl resistant lipase in the blood serum. The author found an increase in the atoxyl resistant lipase in 10 per cent of persons who were apparently free from cancer and also in persons with certain diseases which frequently lead to carcinoma or mask a developing carcinoma such as chronic cystitis, mastitis, bleeding nipple, ulcer of the stomach, gastritis, strawberry gall bladder and gonorrhea. Although the lipase determination as a method of diagnosing carcinoma is subject to error the authors believe that it is of value in clarifying numerous carcinoma problems.

The basis of Fuchs's cancer reaction was also discussed. Four hundred and thirty-eight reactions were studied. In 247 definitely diagnosed cases of cancer or sarcoma the reaction was positive in 129 cases or 52.6 per cent, in 164 non-cancerous cases it was negative in 142 or 89.2 per cent, and in 27 cases of suspected but clinically uncertain carcinoma

it was positive 23 times. The authors then carried out the test in a large number of cases of precancerous conditions and by introducing the sperm substratum proposed by Fuchs they succeeded in separating a large number of these processes from other diseases which previously had frequently given a positive carcinoma reaction. Fuchs's cancer reaction is very reliable for the recognition of cancer.

The authors next attempted to overcome the weaknesses of each method by using one to supplement the other. When both tests yielded positive results the certainty of the diagnosis was increased by the blood examination. Decrease of the lipase and absence of immunity as shown by Fuchs's reaction were often found together but there was no constant agreement. In precancerous processes both reactions were positive at the same time in only 25 per cent of the cases. Usually only one method gave a positive result whereas in cases of undoubted cancer both methods gave positive results more often. In the cases in which both methods gave positive reactions in non-cancerous patients cancer was frequently found in the family. Even when both methods of diagnosis were used together it was not possible to determine the presence of carcinoma with absolute certainty by examination of the blood.

(TORLES) FLORENCE A. CARPENTER

DUCTLESS GLANDS

Collip J. B. The Standardization of Anterior Pituitary Hormones. *Am J Obst & Gynec* 1937 33: 1010.

As we are learning a still increasing number of effects of the extract of the anterior lobe of the pituitary gland it becomes most essential that some system of biological standardization of extracts be agreed upon so that experimental clinical studies can be made satisfactorily and the results adequately evaluated. At the present time there is not enough information to allow the setting up of absolutely rigid standards, but an attempt can be made in this direction and in the course of time as more exact knowledge becomes available methods of setting standards which are to be universally acceptable may be agreed upon.

The author then discusses the various assay methods to be used in the standardization of the growth, thyrotropic, gonadotropic, adrenotropic and prolactin hormones.

Some other effects of the extracts of the anterior lobe of the pituitary gland, such as those upon the size and fat content of the liver, the protein metabolism, the skeletal form and architecture and the blood calcium and calcium metabolism are known and methods for study of all of these are available but it is doubtful whether any of this group of reactions will be of practical value in relation to the standardization for clinical use.

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the *Mémoire sur la Dysenterie* and the *Système d'Épiqueure*. No longer hunted he had time for leisurely conversation and banter with the court savants d'Argens d'Algarottis and Voltaire among others. With the last, little love was lost. Probably each of the two men was jealous of the other's supposed influence with the Emperor.

Just what is the essence of his philosophical works? Today we get no spinal thrills at his ideas as they are openly accepted or at least tolerated by the majority of our generation. However, his ideas were diametrically opposite to the harsh metallic minds and the generally accepted ideas of his day. It was heresy to have a man prove to his own satisfaction at least and in print where all might see and read the fact that 'nature was amoral' as well as to state loudly 'Why should one believe in a providential nature? We have not one proof the greatest chance favors the contrary opinion.' Authors of such ideas were dangerous to State and Church and they should be immediately and completely destroyed and uprooted. So argued those who wore the royal crowns and cardinal caps. La Mettrie was first a true doctor of observation and although for this trait he openly acknowledges his debt to Boerhaave he had the courage to go on and to take up Cartesian materialism and apply it without qualifications to the human body. He favors frank atheism for the Frenchman believes that the existence of God has been unproved and is practically non important for our existence. Argument from design becomes ineffective against the hypothesis of mechanical causality. Man is so complicated a machine that it is impossible to get a clear idea of the machine beforehand and hence impossible to define it.

It was an ironical twist of fate that two of the things of which he was really passionately fond the practice of medicine and his gastronomic athletic were to be the immediate causes and reasons of his death. The accounts of the final illness vary somewhat in detail, but it seems that La Mettrie on a bet gulped down an entire pheasant pastry pie after a many course banquet at the house of Milord Tyrconnel the English ambassador at Berlin. Shortly after this awe inspiring feat the King's Reader was seized with what appeared to be botulism an outcome not surprising when one reads a description of this 'snack of pastry' for it was made of eagle disguised as pheasant which had arrived from the North, with plenty of bad lard pork hash and ginger in it. At any rate the attending German physicians advised purges. To this the sick man violently disagreed. 'Bloodletting was the procedure of choice here he gasped between cramps and ordered repeated venesections. Reluctantly they complied with his wishes and the Frenchman was bled no less than eight times.

At the moment of death an Irish priest, a Father MacMahon, chaplain of the Ambassador desired to convert La Mettrie and elbowed his way into the death room. The dying man would have nothing to do with him but the Father persisted in sitting down and waited expectantly by his bedside. To quote Carlyle again 'La Mettrie in a twinge of agony cried out 'Jesus Marie! Ah vous voilà enfin retourné à ces noms consolateurs' exclaimed the Irishman. To which La Mettrie answered in polite language to the effect 'Bother you! and expired a few minutes after.

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DECEMBER, 1937

International Abstract of Surgery

Supplementary to
Surgery, Gynecology and Obstetrics

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INTERNATIONAL ABSTRACT OF SURGERY

DECEMBER, 1937

COLLECTIVE REVIEW

SURGERY OF THE CORNEA

RAMON CASTROVIEJO, M D, New York, New York

FOREWORD

THE operations suggested for the treatment of corneal conditions have been so numerous that an exhaustive review of all of them would be impossible in this presentation. The limitation of space will allow mention of only the most significant contributions, with special reference to those containing original work. Special emphasis will be given to recent advances in operative technique. Many of the contributions found in the literature in recent years are in the form of reports of cases operated upon according to techniques that have been in use for many years. In such instances, the names of the authors contributing case reports will be mentioned, preceded by a short historical background of the operations advocated in each particular field.

SURGICAL TREATMENT OF CORNEAL ULCERS

Numerous operations have been advocated for the treatment of corneal ulcers when milder forms of treatment have proved ineffectual. Among the best known procedures are paracentesis, the keratotomy of Guthrie-Saemisch, the delimiting keratotomy of Gifford, curetting, cauterization (chemical, thermic or electric), and conjunctival keratoplasty. Paracentesis or the keratotomy of Guthrie-Saemisch has been advocated when milder forms of treatment have failed, because of the proven fact that ulcers have a tendency to heal after spontaneous perforation. The principle of the treatment seems to be the production of a marked hypotension, removal of the toxic aqueous humor and its replacement by a fluid richer in

albumin and antibodies, and increased nutrition of the cornea. The combination of these factors promotes healing of the ulcer.

Paracentesis of the anterior chamber is so widely known that even a short description of the procedure seems unnecessary. The Guthrie-Saemisch operation consists of splitting the whole width of the ulcer in its center, with a Graefe knife. The puncture, 1 or 2 mm in length, is made in clear corneal tissue to the outer side of the ulcer and into the anterior chamber with the edge of the knife directed forward and emerging 1 or 2 mm, also in clear corneal tissue beyond the inner side of the ulcer, the knife cutting through the floor of the ulcer. The incision may be re-opened for several days until the ulcer improves.

Other modifications of the Guthrie-Saemisch keratotomy, based on the same principle of producing hypotony, have been advocated. Sondermann advocates trephining with the object of maintaining a prolonged hypotony. Pacalin resorts to the galvanocautery to perforate the ulcer and obtain the desired hypotony in a simpler and more aseptic way. Delord uses a strabismus hook, red hot, to fistulize the center of the ulcer.

H. Gifford in 1919 described a new procedure, called delimiting keratotomy, which is particularly useful to stop the progress of advancing ulcers. The operation consists in an incision made completely through the cornea, tangential to the advancing border of the ulcer (Figure 1). Since H. Gifford published his article in 1918, S. R. Gifford and Gradle have advocated the same procedure. The good effect of this procedure is due, according to the authors, to the resulting hypotony with consequent increase of antibodies and nutritional elements reaching the cornea, and

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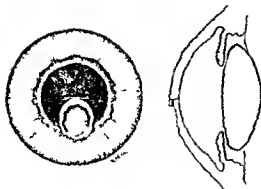


Fig 1 Gifford's debriding keratotomy

perhaps also to the epithelial barrier which lines the margins of the incision

Other surgical procedures used in the treatment of corneal ulcers, such as superficial cauterization with the thermocautery and galvanocautery, and curetting, are sufficiently known to make unnecessary their further discussion. The use of conjunctival flaps for the treatment of corneal ulcers will be dealt with later.

CONJUNCTIVAL KERATOPLASTY AND OTHER PLASTIC OPERATIONS FOR RECURRENT PTERYGIUM, PSEUDO PTERYGIUM AND SINCHELPHARON

After Schoeler in 1876 and Kuhnt in 1884 described their methods with conjunctival flaps for the treatment of corneal conditions numerous authors have published papers either advocating the techniques of the first two authors or modifying them according to their needs.

Kuhnt is the author who has worked most extensively on the subject of conjunctival keratoplasty and his techniques are probably the most widely used. Kuhnt uses two different kinds of conjunctival flaps: pediculated and non pediculated. The pediculated flaps may be of the bridge type, generally no wider than 5 or 6 mm. with one (Figures 2 A and B) or both ends (Figures 2 C and D) still continuous with the bulbar conjunctiva. The flaps are normally held in place with sutures. In addition to the very narrow flaps generally used to cover small corneal defects large flaps are advocated by Kuhnt to partially or totally cover the whole cornea. If only half of the cornea is to be covered an incision about half of the circumference of the cornea is made through the conjunctiva near the limbus; the conjunctiva undermined, and the flap thus obtained sutured

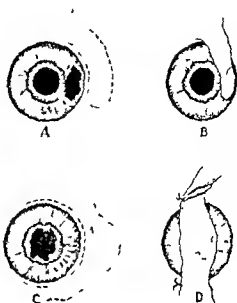


Fig 2 Kuhnt's method of making conjunctival flaps

to the episclera near the margin of the cornea at opposite sides (Figures 3 A and B). The episcleral sutures are placed slightly beyond the ends of the incision in such a way that when they are tied the conjunctival flap will be held securely in position and cover about half of the cornea and with it the corneal lesion, without exerting an undue tension. In about from five to seven days the sutures become loose and fall out or they are removed; the conjunctival flap returning by itself to its original position. When the whole cornea is to be covered by conjunctiva two conjunctival flaps are made in the same manner as described above; the incision at the conjunctiva going all around the margin of the cornea or small uncut areas are left at opposite ends of the same diameter. The flaps are sutured together over the center of the cornea (Figure 3 C). The sutures if not loose by the eighth day should be removed. Another way of covering the whole cornea by using only a large conjunctival flap is illustrated in Figure 3 D. Sometimes the conjunctiva around the cornea is not suitable for the use of pediculated flaps and free grafts of conjunctiva are then used instead. They may be obtained from the same or opposite eye. The flap is placed in position to cover the

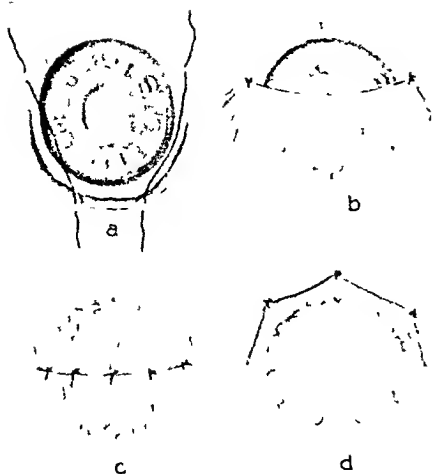


Fig 3 Different types of conjunctival flaps to cover part or all of the cornea

lesion, and sutured to the surrounding conjunctiva

Conjunctival flaps have been advocated by Kuhnt for descematocele, staphylomas, fistulas and penetrating injuries of the cornea, ulcers, perforating operations when there is reason to expect loss of vitreous, or coloboma of the iris. In cases in which it is necessary to re-enforce a considerably weakened cornea, Kuhnt uses a conjunctival flap thickened with episcleral or even scleral tissue

Wheeler has been using conjunctival keratoplasty for the past ten years for the treatment of hypotony following filtering operations. Wheeler's own description and comments on the operation follow: "Occasionally too low tension results from purposeful operations for glaucoma and occasionally a leaky wound follows cataract extraction and penetrating wounds near the limbus. For such cases a definite re-enforcement of the filtering wound may be important. For example, in an eye trephined superiorly at the corneosclera, a crescent of epithelium is removed from the upper part of the cornea with a curette (Figure 4 A). The conjunctiva is dissected from the limbus in its upper half and the conjunctival epithelium is undermined (Figure 4 B). Then the conjunctiva is drawn over the denuded area of the cornea and sutured to the episcleral tissue near the limbus at about the horizontal meridian (Figure 4 C). The conjunctiva will adhere firmly and definitely only where the epithelium has been removed, and this

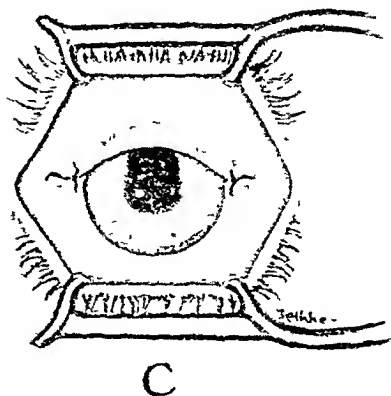
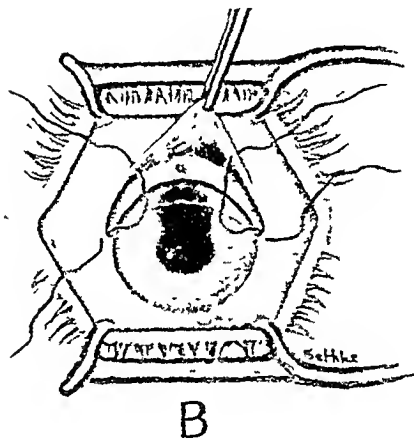
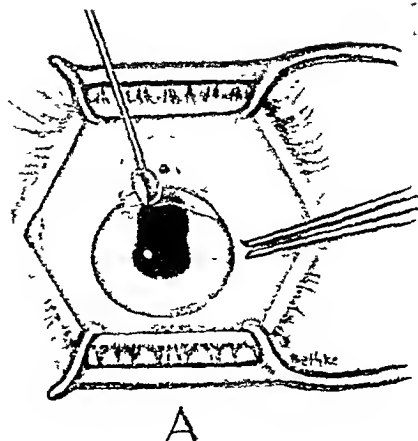


Fig 4. Wheeler's operation for the treatment of hypotony following filtering operations

adhesion will remain permanently. The tension will rise after the flap has been put in place and there may be a temporary hypertension. In nearly every case, however, there will be an adjustment to the normal tension range. The operation is satisfactory in raising intra ocular pressure.

However, there should be warning about one thing. If the conjunctiva is freely undermined and pulled down a ptosis may result so probably it is best for the surgeon to refrain from cutting away conjunctiva in the region of a bleb. Rather, this conjunctiva should be saved for the overlapping of the denuded cornea. If ptosis should result from the operation, tarsal resection or resection of the levator gives satisfactory correction.

Free flaps of buccal mucosa and skin are also used extensively in cases of large recurrent pterygiums, pseudopterygiums, and burns. They are handled in the same manner as the non-pediculated flaps of conjunctiva; they are placed over the exposed corneal area and sutured to the surrounding conjunctiva.

Conjunctival flaps have also been employed in corneal transplantation in order to hold the graft in position during the first few days while it becomes united to the surrounding corneal tissue. The author of this paper has claimed that conjunctival flaps in these cases not only acted mechanically to hold the grafts in position but nourished the transplant during the early stages of healing and thus accelerated cicatrization and prevented the loss of the eye if the transplant became detached.

Chojnacki in 1934 reported successful healing of a corneal fistula after application of an egg membrane. All previous treatments had been ineffectual. The first to report the use of egg membrane for the treatment of corneal fistulas was Coover in 1831.

OPERATIONS FOR CONICAL CORNEA (KERATOCONUS)

The first surgical procedure applied for the cure of keratoconus was that of Ware who in 1810 advocated paracentesis of the anterior chamber followed by moderate pressure to prevent the return of the projection. The same procedure was recommended by Dix and Desmaries d'Ereux in 1847. Adams in 1817 advocated needling of the lens in order to neutralize the increased refractive error produced by the deformity of the cornea.

Middlemore in 1835 and Tyrell in 1840 proposed moving the position of the pupil from behind the most altered portion of cornea. The operation consisted in incarcerating the iris in a

corneal opening made near the limbus. In 1839 Favio resorted to the removal of a V shaped flap at the apex of the cone without the application of sutures.

In 1858 Critchett modified the operation of Middlemore and Tyrell by tying a single knot in the prolapsed iris with a fine silk thread. The strangulated portion of the iris fell off in about forty eight hours, and the iris remained incarcerated in the corneal cicatrix. The procedure named 'iridodesis' by the author, left the pupil in the desired position to obtain the most useful vision.

Bowman in 1860 resorted to the practice of a double iridodesis. Having observed that vision in keratoconus improved frequently by the use of a stenopæic slit, he incarcerated the pupillary borders twice near the limbus, at opposite ends of the same diameter. The result was the formation of a slit like pupil which could be placed in any desired direction across the cornea, however, Bowman believed the vertically placed pupil was to be preferred.

In 1866 von Graefe recommended the dissection of the superficial layers of the cone with a knife followed by the application of a silver nitrate stick for the purpose of producing a flattened scar after the ulcer was healed. Meyer in 1887 also advocated Graefe's operation slightly modified.

Bowman in 1867 and later in 1873 resorted to the use of trephining to remove the superficial layers of the corneal cone. The center of the bulged area thus dissected was punctured and kept open with repeated paracentesis until the cone had flattened.

In 1872 Bader claimed to have obtained favorable results by excision of an elliptical piece of full corneal thickness at the apex of the cone. To reduce the danger of iris prolapse in Bader's operation and to assist in early closure of the wound Badal in 1901 inserted three horse hair sutures vertically through the cornea previous to removal of the apex. The sutures were quickly tied following the excision of the elliptical piece of cornea.

Critchett in 1895 also advocated the removal of a small elliptical piece of the cone at the apex. The incision was begun with a knife and completed with scissors. Wolfe in 1892 first produced an opacity of the apex of the cone and then made a small artificial pupil behind transparent cornea.

Grandclement in 1891 advocated tattooing of the cone and optical mectomy. In 1905 Stoenner used a conjunctival flap to cover the cornea after the excision of the cone.

The cautery was used for the treatment of keratoconus as early as 18,9 by Gayet, and later

advocated by Andrew in 1884 and Critchett in 1895. Since then, the number of contributions advocating the use of cautery has been immense. Among the many authors recommending the cautery to burn the apex of the cone are Tweedy and Sattler in 1900, Swanzy in 1903, Siegrist in 1916, and Morris and Knapp in 1929. Siegrist recommended cauterization combined with repeated paracentesis. Swanzy thought that cauterization should not perforate the cornea, while Tweedy and Knapp were supporters of perforation. Elschnig in 1904 superficially cauterized the apex of the cone, as well as an area, of the same width, connecting the apex with the nearest point of the conjunctiva at the limbus, the object being to produce vascularization with subsequent proliferation of the connective tissue and flattening of the cone.

A case of keratoconus was cured by Carpenter in 1915 with the use of the high frequency spark. Iridectomy was used by von Graefe in 1858, and later advocated by Wells in 1873. Corneoscleral fistulizing operations were recommended by Adams and Tiffany in 1914, by Green in 1920, and by Wibo and Rasquin in 1934.

Fox reports in 1925 that flattening of the cone may follow excision of a corneal segment adjacent to the ectatic portion.

Extraction of the lens, which was advocated by Adams in 1817, has been employed recently by Nicolato in 1930, who recommends extraction of the lens in adults and repeated discussions in younger patients.

Appelbaum in 1936 published an excellent paper dealing extensively with the etiology, pathological characteristics, symptomatology, objective signs, and treatment of keratoconus.

Recently the author performed a keratoplasty in a patient with advanced keratoconus, with marked improvement of vision and apparent cessation of the progress of the disease (Figure 5). Since the tissue surrounding the transplant is healthy, keratoplasty in keratoconus should be successful in a high percentage of cases. No definite conclusions can be drawn from the study of one case, but further work with corneal transplantation in very advanced cases of keratoconus may prove keratoplasty to be the treatment of choice for such a condition.

TATTOOING OF THE CORNEA

Tattooing of the cornea has been employed for visual and cosmetic purposes. For visual purposes it has been used to render opaque the apex of keratoconus or superficial opacities which, situated in the pupillary area, greatly interfere with

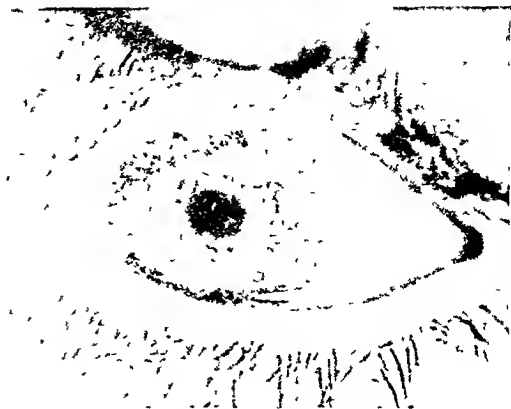


Fig 5 Transparent corneal transplant in a case of keratoconus, seven months after operation. Vision before operation 3/200, after operation 20/100.

vision by dispersing the light passing through the translucent area. At other times the undue dispersion of light is produced by a large iridectomy, and in such cases the transparent corneal area in front of the iris opening may be tattooed.

Tattooing of the cornea has also been reported to be useful in albinism, aniridia, and coloboma of the iris. Tattooing of the cornea has been known since ancient times. In the second century A.D., Galen ulcerated the leucomatous cornea with a hot iron rod, and applied a preparation of powder pomegranate bark, and copper salts for the purpose of leaving indelible spots covering the opacity.

Mention of corneal tattooing is made later by Aetius de Amida in the fifth century A.D. and by Pablo de Egina in the seventh century A.D. In 1743 Boury wrote a very complete thesis on the subject. More than one hundred years later, Shuh, in 1860 and Rava (de Sassari) in 1861 tried corneal tattooing, which resulted in failure.

The first successful trials of corneal tattooing using India ink were made in 1869 by de Wecker. The first successful results obtained by de Wecker were reported by one of his pupils, Pomier, in 1870. Research workers after de Wecker improved the operative technique by devising new instruments or employing different coloring substances. Some used black pigment exclusively, others experimented with different colors to match the color of the iris, and reserved the use of black pigment for the pupillary area only. The operation of corneal tattooing with India ink consists in introducing a thick paste of the ink into the corneal parenchyma with the aid of a bunch of needles or with a grooved needle.

Levis, Woinow, and Taylor in 1872, Archer in 1874, Abadie in 1884, Masselon in 1886, Bacher in 1887, Cosier in 1902, Holth in 1904, and Chevalierau and Polack in 1906 dealt exclusively with corneal tattooing in colors.

Taylor in 1872, Bajardi in 1893, Lippay in 1897, Holth in 1898, Maklakoff and Nieden in 1901, Armagnac in 1903, Hesse in 1907, and Rollet in 1928 published different modifications of the technique of corneal tattooing with India ink. Nieden, in 1901, and Rosselli, in 1907, reported their experiments in corneal tattooing with the use of choroidal pigment of different species of animals. In 1911 Streiff reported the results of his experiments with powdered gold. In 1925 Knapp completely changed the technique of corneal tattooing and employed the chemical tattooing by which metallic salts are reduced and precipitated in the corneal parenchyma. Knapp experimented with potassium ferrocyanide, iron sesquichloride and gold chloride. Only the last proved successful. Knapp's technique consists in the application of a neutral solution of gold chloride (1 to 5 per cent) to the area of cornea previously denuded of epithelium. The solution is allowed to remain for two or three minutes, after which adrenalin chloride is instilled, the gold salt being reduced with production of a dark brown almost black precipitated coloring. Since Knapp described his technique with gold chloride in 1925 many authors have reported successful results with its use.

Gifford and Steinberg in 1927, Krautbauer in 1928 and Bietti in 1929 experimented with silver nitrate but it proved to be very irritating for the tissues. In 1928 Krautbauer modified the chemical method of Knapp substituting platinum chloride for gold chloride. Holth in 1920 tried iron sulphate and tannic acid both in 5 per cent solution. The chemicals were found to be very irritating to the tissues.

In 1932 Fedenci experimented with sulphate and precipitated different metals in the corneal parenchyma with encouraging results.

In more recent years numerous papers have appeared reporting cases in which some of the techniques herein described slightly modified were used. Lagleyze in 1935 and 1936 published an excellent paper in which the history and technique of corneal tattooing were extensively reviewed and 10 cases tattooed with gold and platinum chloride were reported. Dugan and Nanavati in 1936 reported a series of 25 cases of corneal opacities in which a satisfactory result was obtained with the use of gold and platinum-chloride tattooing.

SUPERFICIAL KERATECTOMY FOR THE REMOVAL OF CORNEAL SCARS AND PANNUS

In addition to keratoplasty, other operations have been advocated for the restoration of vision to those eyes that have lost it through opacification of the cornea.

Boury in 1743 was the first to mention the resection of the external layers of the leucoma in order to restore vision.

Platner in 1747 and Gouan and Bell in 1788 also advocated the method of Boury. Maligngne in 1843 claimed for himself the role of the originator of the method in a letter addressed to the Institute of France but was immediately rebuked by Desmarres, who did not approve of the method and stated that it had already been practiced and abandoned by Demours in 1818. Maligngne said in his letter that, convinced that the leucoma was located in the superficial layers of the cornea, he tried to resect these superficial layers. In animals the success was complete. He performed the operation on a blind girl sixteen years of age, who could see immediately after the operation. In 1845 Maligngne reported again on this case, and stated that the patient operated upon for leucoma could still see two years after the operation.

In recent years the operation for the excision of corneal scars has been advocated by Benedict in 1934. Wiener has been a strong advocate of this type of operation for some years. In his last publication, in 1936 he says: "The most favorable type for surgical intervention with the purpose of restoring sight in patients with corneal leucoma, is when the cornea has been burned by carbide or some caustic not penetrating more than two thirds or three fourths of the thickness of the cornea. Such cases respond well to the resection of the entire scar."

The operation for the removal of the superficial layers of the whole cornea including the scar (total superficial keratectomy) consists in making two incisions across the entire cornea at right angles to each other and dissecting the four sectors of cornea thus outlined with the aid of a cataract knife held flat against the corneal surface so as not to perforate. The dissection is carried from the center of the cornea to the periphery, as illustrated in Figure 6. The author has been doing this operation as a preliminary for corneal transplantation in cases of corneal pannus due to injury. The operation was combined with pentony as illustrated in Figure 6, which combination seems to give more satisfactory results. However this type of operation always leaves some degree of corneal opacity, which largely defeats the operation for visual purposes.

STAPHYLOMA OF THE CORNEA

The operation for the removal of staphyloma of the cornea has been advocated for more than one hundred years. If the staphyloma extends over the whole area of the cornea, the whole staphyloma may be excised and the edges of the incision brought together by sutures. Conjunctival flaps may be used to cover the wound. Such types of operations were described with various modifications by Beer in 1817, Critchett in 1863, Knapp in 1868, and de Wecker in 1873.

Fuchs in 1894 advocated keratoplasty for the treatment of staphyloma and fistulas of the cornea, not for visual purposes but with the object of strengthening the weakened tissue. Von Hippel also recommended keratoplasty as the method of choice to treat staphyloma.

Kuhnt in 1898 recommended the removal of the superficial layers of the staphyloma, he performed an indectomy to keep the tension down, and covered the defect in the corneal substance with a conjunctival flap 2 or 3 mm wider than the defect.

Proeller in 1903 operated upon some cases of total staphyloma according to von Hippel's technique of partial penetrating keratoplasty.

In 1906 Fage dissected the staphyloma, sutured the edges of the wound with cross sutures, and covered the whole cornea afterward with a conjunctival flap closed with a pouch suture.

In 1910 Kuhnt advocated the removal of the whole thickness of the staphyloma and covering the defect with a conjunctival flap fastened to the sclera with sutures.

In 1913 Dimmer flattened the staphyloma, removing an elliptical piece of the scar tissue, and closed the wound with sutures.

In 1919 Loewenstein advocated the removal of the staphyloma including some healthy corneal tissue surrounding it, and leaving an elliptical defect which is filled with transparent corneal tissue obtained from an enucleated eye (keratoplasty). The flap is kept in position with corneal sutures fastened to the edges of the corneal wound.

In 1921 Tenner recommended the removal of the staphyloma, and closed the corneal wound with sutures fastened to small gold plates.

Francois in 1936 advocated as the best procedure for the treatment of marginal degeneration of the cornea, the excision of the ectatic portion and covering the wound with a conjunctival flap afterward.

The operations for staphyloma reported the last few years vary very slightly from those herein mentioned. More recently, if the staphyloma is not very large, cauterization with the electro-

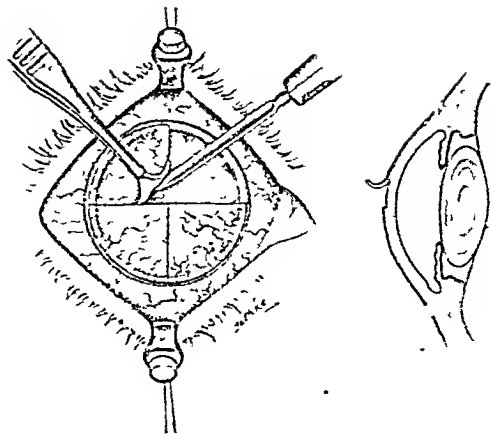


Fig 6 Total superficial keratectomy combined with pentomy for the treatment of corneal scars and pannus.

cautery and also diathermocoagulation have been used to shrink the staphylomatous area and flatten the cornea. The last procedure has been recently used by Foussier in 1936. The procedure consists in touching lightly the entire protruding surface, with care not to perforate. Cauterization or diathermocoagulation may have to be repeated until the desired flattening has been obtained.

KERATOPLASTY

Since 1789, when de Quengsy suggested the operation of replacing opaque corneas by a piece of glass, numerous techniques have been proposed and tried out for the same purpose. Most of the first trials were disastrous, and had only historical value.

In the last two years the interest of ophthalmologists in this problem seems to have awakened, and numerous reports of keratoplasties have appeared in the literature. The technique used by most authors varies very slightly from that of von Hippel and modifications of his technique by Elschmig, Filatow, and Thomas. A short historical review will be presented first, including the techniques used by the four men who have had the most experience in this field during recent years, namely Elschmig, Filatow, Thomas, and the author. Later the literature on the subject will be briefly reviewed.

There are three main types of keratoplasty:

- 1 Total keratoplasty, wherein the entire cornea is transplanted as a whole, with or without 2 or 3 mm of the surrounding conjunctiva. All the cases reported in the literature of this type of operation have resulted in failure. This type of operation offers only a temporary improvement

of vision. The implant invariably becomes opaque and the eye is in danger of being lost through secondary glaucoma or phthisis bulbi.

2. Circumscribed or partial lamellar keratoplasty, wherein a circumscribed area of superficial lamellae of an opaque cornea is replaced by similar tissue from a transparent cornea. This type of operation is applicable only in cases in which the lesions are very superficial. Superficial lesions rarely extend over the whole surface of the cornea and optical iridectomy could often be performed in these cases instead of keratoplasty. When the opacity is very extensive it may be necessary to perform a keratoplasty operation although the formation of connective tissue at the base of the transplant largely defeats the success of the operation for visual purposes.

3. Circumscribed or partial penetrating keratoplasty, wherein a variable area of full thickness of the opaque cornea is replaced by a corresponding piece of transparent cornea. This type of operation has offered the best permanent results up to the present day and shall be discussed with more detail later.

It was not until von Hippel presented his techniques of partial penetrating keratoplasty in 1887 and partial lamellar keratoplasty in 1888 that the foundations of modern techniques of corneal transplantation were laid. The partial penetrating keratoplasty of von Hippel consisted in removing a full thickness disc of from 4 to 5 mm in diameter of the leucomatous cornea of the host with his model of trephine and replacing it by a similar disc obtained from the cornea of a donor. The partial lamellar keratoplasty of von Hippel consisted in replacing a disc of part of the thickness of the leucomatous cornea of the host by a disc of the same diameter but of full thickness taken from the cornea of a dog. Von Hippel claimed that with his techniques the problem of keratoplasty in relation to form and size of the transplant had been solved. He also stated that lamellar keratoplasty is easier to perform than the penetrating type and is less liable to loss of vitreous and displacement of other intraocular structures such as the lens. Von Hippel did not report permanent successful transplants in human beings operated upon according to his technique. However since then many authors have reported cases operated upon according to his method.

It has been admitted by most authors that partial penetrating keratoplasty produces the best permanent results and is the only method that offers hope. Practically all successful cases of keratoplasty reported in the literature in recent years belong to this type, therefore in the review

of the literature which will follow only this type will be considered.

Zirm in 1906 operated on one patient with a leucomatous cornea as a result of a limeburn with von Hippel's trephine. The operation was of the partial penetrating type. The flap was held in position with cross sutures inserted in the conjunctiva close to the limbus. Vision before the operation was sufficient to distinguish motion of the hand. One year later vision was 6/36.

In 1921 Evelyn and Carrell made a corneal flap rectangular in shape, with the cataract knife, with a step on the edges, which prevented the graft from falling into the anterior chamber. The graft was afterward held in position by six sutures. One of 5 cats operated upon retained permanent transparency of the graft.

In 1919, 1922, 1923, and 1927, Ascher, from Elschning's clinic, wrote complete papers on keratoplasty, and gave the results of such operations at that clinic. Later Elschning in 1920 and 1922, Elschning and Gräde in 1923, Stanka in 1927, Liebsch in 1929 and Elschning again in 1930 presented reports of cases in which operations had been performed in Elschning's clinic.

Elschnig's technique (Figure 7 A) is a slight modification of von Hippel's. Von Hippel's trephine of from 4 to 5 mm in diameter is used to remove a disc of full thickness from an opaque cornea which is replaced by a similar disc of transparent cornea. A bridge suture is placed from the conjunctiva of the upper limbus over the transplant and tied in a similar position to the conjunctiva of the opposite side. Essena is used before the operation, in order that the pupil will be contracted and protect the lens from possible injury with the trephine.

The operation is performed under local anesthesia. Palpebral akinesin, the retrobulbar injection of procaine and epinephrine and the superior rectus suture add safety to the operation.

The transplant is obtained from a patient's eye or from eyes of adults or infants, enucleated shortly after death. Elschning expresses the belief that any kind of solution hurts the transplant; therefore he keeps the graft between layers of dry cloth after it has been excised with the trephine.

Of the 174 patients operated on in the last twenty years in Elschning's clinic 113 had leucoma of the cornea due to flames, chemical burns or ulceration which destroyed the entire cornea. In 22 cases in the majority of which aphakia was present, the implants did not remain in place and closure of the hole left by the trephine had to be accomplished eventually by means of a conjunctival flap. The disc remained clear in only

15 cases, and partially transparent in 31. In all of these cases, however, there was improvement in vision. In 45 cases the implant became totally opaque. The greatest improvement of vision was from hand motion to vision graded 6/6.

In 26 cases of interstitial keratitis, in which the scars were thick, 1 disc was lost, and 6 other discs became opaque, in 2 cases the flaps were partially transparent, and in 17 cases the corneas were very clear and the improvement in vision was marked.

Elschnig arrives at the conclusion that the circumscribed penetrating keratoplasty of von Hippel is the only dependable method. He expresses the opinion that keratoplasty will be successful in about 22 per cent of all patients with leucoma who are more than fourteen years of age, whose anterior chamber is normal, and who give no evidence of increase of ocular tension, and in about 73 per cent of the patients with interstitial keratitis. "Transplantation material," he said, "can be obtained from the eyes of young as well as of old persons with normal corneas, it is immaterial whether the remaining part of the anterior segment is normal or pathologically changed, or whether the donor has glaucoma or hypotension (phthisis bulbi)." He did not find any relation between hemolysis or agglutination of the serum and the transparency or opacification of the transplant.

In 1928 Filatow modified von Hippel's operation in trying to eliminate its disadvantages, namely, the imperfect way in which the transplant is held in position, and the unfortunate way in which the iris and lens may be injured with the trephine. A flap is made in the upper part of the bulbar conjunctiva (Figure 7 C), and an incision is made in the lower conjunctiva, near the lower limbus. With a cataract knife a puncture and counterpuncture are made in the cornea, which leave two parallel perforating incisions through which a strip of celluloid, or prophylactic spatula, is passed. This strip penetrates the anterior chamber, and separates the cornea from the iris and lens. The leucomatous cornea is trephined, and a transparent flap taken from an eye of a patient or from an eye enucleated from a cadaver shortly after death, replaces the trephined leucomatous disc. The conjunctival flap, with its epithelial surface downward, is stretched over the transplant and fastened with two sutures to the lower conjunctiva near the limbus. The strip of celluloid is then removed.

Since 1928 Filatow has published a number of papers dealing with corneal transplantation. In recent publications, in 1935 and 1936, he describes

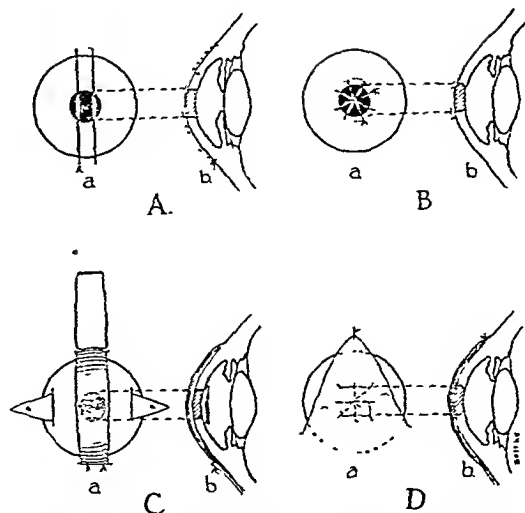


Fig. 7. Technique of circumscribed penetrating keratoplasty: A, Elschnig's; B, Thomas'; C, Filatow's; D, the author's.

a new trephine (Filatow-Marzinkowsky), which is a combination of a hand trephine and a protective spatula, and facilitates the performance of his operation. The trephine is constructed in such a way that drainage of the aqueous humor, once the cornea has been perforated, is prevented. Filatow modifies his technique according to the necessities of the case. For instance, when it is impossible to use the conjunctival flap because of scar-tissue changes, a small round piece of boiled-egg membrane with its inner surface toward the implant, is used instead. Bridle incisions are made in this egg membrane for better fitting, and bridge sutures in the manner of Elschnig are placed vertically and horizontally for fixation both of the egg membrane and the implant.

If the recipient cornea is thickened by scar tissue and therefore presents an unfavorable field to receive the transplant, Filatow tries to improve the condition of the cornea. One of the methods he uses is to excise the leucoma layer by layer almost to the posterior one on a large surface, and the wound is covered with the superficial corneal layers of another eye. The whole cornea is afterward covered by a conjunctival flap. The purpose of such an operation is not to restore vision, but to create a better field for a later corneal transplantation.

When the leucoma is so thick that it is impossible to examine the anterior chamber and the eye appears to have not only synechiae but scar tissue, Filatow cleans the whole posterior surface

of the cornea by exenteratio retro-cornealis anterior partialis. The technique improved by Filatow follows

1 Two sutures are made in the manner of Liegar

2 A section is made along the limbus on two-thirds of its circumference

3 The flap is turned up and cleaned from the synechiae

4 The scar tissue is cut with von Graefe's knife and, without being pulled with forceps, is cut off with scissors so as not to injure the ciliary body. The vitreous usually escapes freely

5 The flap is put in its place, and the sutures are tied. If the eyeball collapses an injection of physiological solution of sodium chloride is made. There is a certain risk in this operation, of course, but if the eye stands it well, there are chances for successful transplantation

In regard to the material for transplantation Filatow uses eyes enucleated from patients or eyes of cadavers enucleated shortly after death. The cadaver eyes have to be enucleated according to Filatow, within a few hours after death. They may be used immediately after enucleation or preserved in citrated blood from the person from whom they were obtained, and kept at a temperature of from 4 to 6° C above zero, to be used from twenty to fifty six hours after death. Filatow found the corneas obtained from cadavers even those preserved for a long time to be just as good as those taken from living persons

Filatow reports on his cases as follows, according to the quality of the operative field

1 In eyes with leucoma complicated with glaucoma, buphthalmos, and symblepharon corneal transplantation gives no positive results

2 In rough cicatricial leucomas a permanent transparent transplant can be obtained only in a few cases

3 Successful transplants may be done only in the case of leucomas in which some transparent corneal tissue remains. Filatow confirms the belief of Elchnig that it is important to have corneal tissue in the leucoma in order to obtain successful corneal transplants

From 1923 to 1935, 205 operations have been performed in the ophthalmological clinic of the Medical Institute of Odessa. Among these only 96 have been studied completely. Fourteen patients preserved a permanent transparency of the graft. They were observed from one to six years, except for one patient who died seven and a half months after operation

Majewski in 1925 experimented on animals by using the 4 mm. trephine of von Hippel to incise

the superficial layers of the cornea cutting the deeper layers with another trephine 3.5 mm in diameter, and making in this way a step which would prevent the transplant from falling into the anterior chamber

In 1930 Thomas described a new modification of von Hippel's technique (Figure 7 B), the main features of which were to outline a disc with a trephine from 4 to 4½ mm in diameter in the leucomatous cornea of the host. Then the trephine is sloped to 45° and rotated, so as to cut through at one point. At this point one blade of a scissors penetrates into the anterior chamber and the remaining inner layers of the outlined corneal flap are cut in a shelving manner so that the endothelial aspect of the disc is smaller than the epithelial surface. With a trephine slightly smaller than the one used in the host, a similar disc is obtained from a transparent cornea. The leucoma is replaced by the graft and is kept in position by cross sutures previously inserted into the cornea a small distance from the graft itself. Thomas attaches considerable importance to the size of the transplant and its relation to the size of the defect. The transplant should be smaller than its bed since the former undergoes some swelling and if it is originally of the same size as the latter, the result is a bulging cicatrix with irregular edges. In Thomas' technique the transplant is firmly held in position by cross sutures. The shelving of the transplant prevents it from falling into the anterior chamber and the dilated pupil prevents anterior synechiae. The transplant is obtained from eyes of patients and is kept in olive oil for a short while before it is finally placed in the eye of the host

Since 1930 Thomas has published a number of papers reporting successful corneal transplantations both in animals and human beings according to his technique. By 1937 he had performed 36 operations in 32 eyes, the graft remaining transparent in 83 per cent of the favorable cases

Experimenting with heterogeneous grafts in rabbit eyes, Thomas in 1935 arrived at the conclusion that heterogeneous grafts should not be used for corneal transplantation in man

In 1932 the author reported a new technique of partial penetrating keratoplasty with which a high percentage of transparent corneal grafts was obtained in animals. Since then the author has published more papers on the subject and reported cases of successful corneal transplants both in animals and human beings. In the last publication about this subject in 1936 the author's technique is described as follows (Figures 7 D and 8)

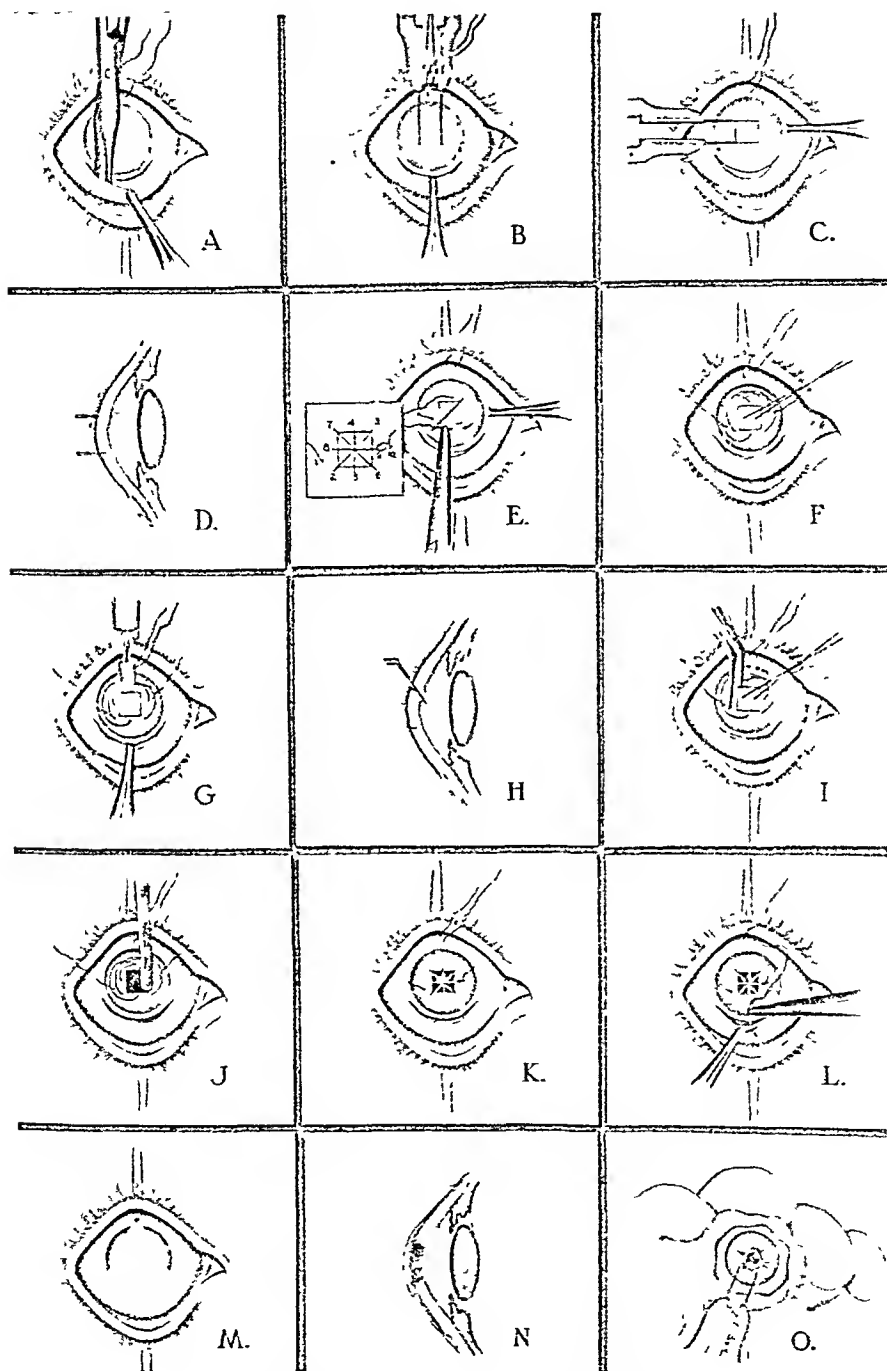


Fig 8 Author's technique of partial penetrating keratoplasty

The pupil is widely dilated with atropine, and a conjunctival flap is made below (Figure 8 A). The leucomatous area of cornea to be removed is outlined with a double knife without penetrating into the anterior chamber (Figures 8 B C, and D). A continuous corneal suture is inserted outside the edges of the outlined square (Figure 8 E). This suture will be destined to hold the transplant in position. Another suture is inserted within the outlined leucoma to facilitate the removal of this segment (Figure 8 F). The upper edge of the leucoma is cut through with a keratome kept at an angle of about 45° in order to obtain shelving of the edge (Figures 8 G and H). The other three edges are also cut in a shelving manner with the aid of special scissors (Figure 8 I). During this last manipulation a gentle pull is exerted on the suture to keep the leucoma away from the lens.

In the procedure prevents injury to this structure. Filatow uses a equal in size and shape to the rest of cadavers enucleated is obtained in a similar manner. cadaver eyes have the enucleated eye of a patient Filatow, within a few hours. born infant enucleated may be used immediately. kept from one to forty days at a temperature of $+3$ or $+4$ C (to the 8 J) and (Figures 8 K and L) the transplant is placed in normal position. from seven to nine days.

Filatow reports on his findings to the quality of the transplant.

1 In eyes with leucoma, buphthalmos, neal transplantation gives good results.

2 In rough cicatricial transparent transplant few cases.

3 Successful transplant in the case of leucomas, corneal tissue remains healthy. of Elschnig the corneal tissue in the successful corneal transplant.

From 1923 to 1933 performed in the of Medical Institute of 96 have been studied. patients preserved the graft. They were years except for or a half months after.

Majewski in 1923 using the 4 mm tr

the shape of the graft and the manner of dissecting it, and the use of a conjunctival flap. The author claims that:

1 Beveling of the transplant prevents it from falling into the anterior chamber.

2 Rectangular flaps can be more easily beveled than circular ones.

3 The double knife followed by scissors gives cleaner sections than the trephine scissors combination.

4 The cutting of the edge of the circular flap with scissors becomes progressively more difficult as the diameter of the circle diminishes.

5 Since the cornea is an avascular tissue, the conjunctival flap accelerates the healing process and nourishes the transplant during the first few days following operation. This flap is particularly useful in those cases of dense leucoma in which nutrition of the graft is greatly impaired.

The author has performed more than 100 keratoplasties according to his technique in unselected eyes, and has found that eyes upon which corneal transplantations are performed may be classified in two categories: favorable and unfavorable. Those cases are favorable in which (1) there is normal intra ocular tension, (2) the diseased ocular tissue is limited to the cornea, (3) the leucoma is not very dense although sufficient to cause considerable impairment of vision, and (4) there are areas of clear or slightly scarred cornea surrounding the graft.

Unfavorable cases include those with very dense leucomas extending over the whole or almost the whole cornea (in these cases the transplanting keratoplasty varies the whole cornea could be entirely surrounded by dense scar tissue with aphakia, those with increased vascularized pannus and those cases of corneal cloudiness).

Operation is performed on favorable cases. Percentage of success may be extremely high. In one of the cases of dense leucoma, vision improved from perception of hand to 20/30 (Figure 9).

The anterior segment of the eye is healthy. Such brilliant results must be obtained by a definite improvement in technique. These cases have little or no improvement. A group of unfavorable cases must be performed in order to prepare the final keratoplasty of trans required by some to combat glaucoma.

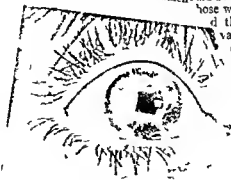


Fig. 9. Transparent transplant in a case of corneal leucoma two and one half years after operation. Vision before operation fingers at 1 ft. after operation 20/30.

removal of synechias whenever possible, preliminary iridectomy when the pupil does not dilate readily, the removal by electrocoagulation or any other method of the thickest vessels in cases of pannus, and resection of segments of cornea in order to obtain an approximately normal curvature when staphyloma is present. Finally, in cases in which the whole cornea has been transformed into dense scar tissue, it will be necessary to perform first a series of transplants in mosaic (Figure 10) to replace the dense scar throughout the cornea by a more permeable tissue and then perform the last corneal transplant for visual purposes.

The author found that corneas obtained from still-born infants or infants who died a few hours or a few days after delivery are as good as those obtained from enucleated eyes of adults, provided the material is obtained shortly after delivery or shortly after the death of the infant (Figure 11).

Friede in 1933 reported 8 cases of partial penetrating autokeratoplasty. Friede's technique was first described by Kraupa in 1914, and consisted in making a penetrating flap of cornea 6, 7, or 8 mm in diameter with a trephine, including the opacity at the center of the cornea and a transparent zone in the periphery. The flap is then turned 180° in order to place the opacity towards the periphery, and the transparent portion in the pupillary zone. In the 8 cases operated on by Friede by this technique, 5 of the flaps healed in clearly, 1 flap became partially opaque, and the two remaining ones resulted in failure.

In 1934 Strachow reported 15 cases of partial penetrating keratoplasty treated with the technique of Filatow. In 20 per cent the transplant remained transparent; in 40 per cent semi-transparent, and in 40 per cent it became opaque.

Friede in 1934 modified the trephine of von Hippel in order to diminish the weight of the instrument and to facilitate a better view of the operative field, which was somewhat hidden when the von Hippel trephine was used. In 1935 Friede reported one more case of successful partial penetrating autokeratoplasty in which a previous homokeratoplasty had been performed without success. In 1936 Friede reported 9 more cases of partial penetrating keratoplasty operated upon by a slightly modified von Hippel's technique. Cadaver eyes were used. Six transplants remained clear. Some of the cases reported by Friede were operated upon only a few weeks previous to the writing of his publication. Three partial penetrating keratoplasties were performed by Friede, in 1936, upon patients with corneal dystrophy. In one case the transplant was still clear ten months after the operation.

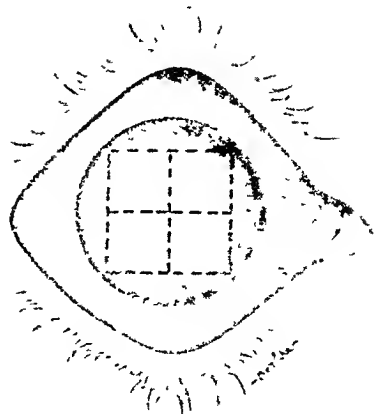


Fig 10 Illustrating the manner in which an extensive corneal leucoma may be replaced for a more permeable tissue by performing successive corneal transplantations in mosaic

Friede does not favor the tobacco-pouch suture of the conjunctiva, because of the possibility of derangement of nutrition, and fixes the flap with a double-crossed suture anchored six times in the episclera.

Rycroft in 1935 and 1936 reported four cases of partial penetrating keratoplasty. The graft was dissected with a 4 mm. trephine, placed in its bed, and retained in position by a conjunctival flap which was secured by a tobacco-pouch suture. Care must be taken that the entire transplant is covered by the conjunctiva, but at no place touched by the suture. In one instance the transplant was clear three months after operation, and vision considerably improved. In all the cases

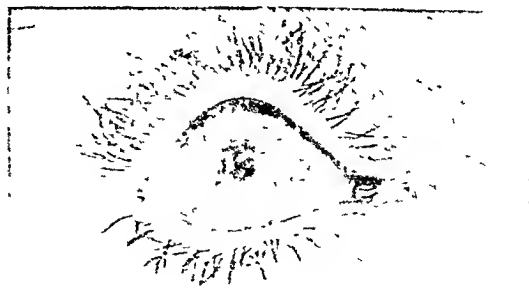


Fig 11 Transparent transplant in a case of corneal leucoma three years after operation. Transplant obtained from the eye of a stillborn infant. Vision before the operation, hand motion at 1 ft.; after operation, 20/70

operated upon by this author the transplant healed and vision improved

Wright in 1933 reported two cases of keratoplasty operated upon following the technique of Thomas. In one of the cases the transplant remained clear and vision was markedly improved.

Wasjutinsky in 1935 reported 15 partial penetrating keratoplasties operated upon with the technique of Filatow slightly modified. Five transplants were clear, eight half clear and two opaque. The duration of observation varied from two to three months.

Sternberg in 1935 reported four more cases operated upon by Filatow's technique. Two transplants remained clear with marked improvement of vision.

Nazarow in 1935 operated on two eyes with opacified corneas due to leprosy by Filatow's technique. Though the transplants healed, vision was not improved.

Towbin in 1936 reported three cases of partial penetrating keratoplasty in which caroun was used in the form of eye drops to prevent opacity of the graft. The transplants vascularized and became cloudy. Two or three minutes after each instillation the transplants seemed to be more transparent than before. Based on this inadequate observation alone, the author arrives at the uncalled for conclusion that caroun has a favorable influence upon corneal transplantation.

Feldman in 1935 reported one case of penetrating keratoplasty according to Filatow's technique. The operation was performed under village conditions. The trephine became blunt while dissecting the leucoma of the host and the donor's graft had to be excised with a chalazion spoon. The graft took and remained partially transparent with improvement of vision.

Franceschetti and Streiff in 1936 reported two cases of keratoplasty operated upon by von Hippel's techniques. In one eye with parenchymatous keratitis the operation was of the penetrating type. In the other eye, with corneal dystrophy, a partial lamellar keratoplasty was performed. The transplants remained rather clear and vision was considerably improved.

Stallard in 1935 reported a new knife to complete dissection of the graft and the leucoma in a shelving manner after the disc has been outlined with a hand trephine. The author claims that with his knife dissection is cleaner than when performed with scissors.

Kurwan in 1935 reported two successful cases of partial penetrating keratoplasty which he performed according to Thomas' technique slightly modified.

In 1934 and 1935 Nizetic described a new knife to be used for partial penetrating keratoplasty instead of the anterior chamber prophylactic spatula of Filatow. The author claims that his technique with the new knife is an improvement upon the technique of Filatow. In 1936 Nizetic reported 24 cases of partial penetrating keratoplasty according to Filatow's method with the use of cadaver eyes. Five transplants remained clear.

Ocht in 1936 reported one more case of permanent transparency of a graft operated upon according to von Hippel's technique.

COMMENT

In surveying the literature on corneal surgery, and especially on corneal transplantation, one is struck with the large number of inadequately and incompletely reported cases. In many instances the period of observation after operation is too short to permit a fair or true conclusion.

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Among the recent additions to the techniques of corneal surgery only a few have proven to be of merit. These include the delimiting keratotomy of H. Gifford for the treatment of corneal ulcers, the Wheeler operation for hypotony following filtering operations, the gold and platinum chloride methods of corneal tattooing, and some of the different techniques of partial penetrating keratoplasty.

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freed early. The use of eserine is preferable to that of atropine in the grafted eye if the graft is large. Atropine may be desirable if the graft is small, this requires judgment. The main object is to avoid anterior synechiae.

The stitches must not be left too long, they may damage the graft. Five days is quite long enough. An optimum result with a clear graft and really good visual acuity is exceptional. Improvement to the extent of allowing a previously "led" patient to see large objects and get about alone is a modest expectation in straight-forward cases. Patients must be warned not to expect too much, this saves disappointment. The most theatrical effects are produced by successful keratoplasty when the blind patient is made to see, but this is by no means the only indication for corneal grafting. As a method of repair it is often far superior to the conjunctival flap, the epithelial graft, and similar plastic procedures.

LESLIE L. MCCOX, M.D.

Neame, H.: The Association of Dendritic Ulcers of the Cornea and of Superficial Punctate Keratitis with Herpes Facialis. *Brit J Ophthalmol*, 1937, 21 295

Neame describes a case of facial dermatitis herpetiformis with fever, associated with dendritic ulcers, a case of herpes around the mouth and on the eyelid, with a dendritic ulcer and two spots that may be classed as nummular or macular keratitis, and a case of typical superficial punctate keratitis with two small dendritic ulcers near the margin, in company with a lesion of herpes facialis on the right side of the chin. It is probably true that herpes simplex is a virus disease. It is claimed that the cases described are not merely rare coincidences, but that they support the contention that many cases of superficial punctate keratitis and its grosser forms, nummular or macular keratitis, and dendritic ulcers of the cornea are the result of infection with a virus capable of producing herpes simplex.

He gives an historical account of the experimental work done and various theories of pathogenesis, and then gives Doggart's groups:

A. Non-recurrent superficial punctate keratitis in which the lesions occur in anterior layers of the substantia propria only. It affects young adults, is non-recurring, but may last as long as two years. Corneal sensation returns with the recovery of the cornea. It occurs in the winter months.

B. Multiple erosions which occur in influenza and acute conjunctivitis, and as a result of chemical vapors, mustard gas, or dust. The epithelium is involved with or without any affection of the superficial layers of the substantia propria. The lesions tend to recur, and are liable to be confused with slighter cases of dendritic ulcer.

C. A miscellaneous group of herpetic conditions with superficial corneal lesions, but no loss of polish. He also includes in his article Schieck's virus infections of the cornea, which are (1) herpes simplex and dendritic ulcer, (2) herpes zoster of the conjunctiva

and cornea, and (3) disciform keratitis, keratitis profunda, superficial punctate keratitis and some cases of neuroparalytic keratitis. He regards herpetic diseases of the cornea as exogenous, and compares them with pneumococcal ulceration. He considers that a lesion of the epithelium allows entry of the virus. Vogt, on the other hand, holds the opinion that they are endogenous. He regards trauma as playing a rôle comparable with that of injury before the onset of interstitial keratitis in that the area of lowered resistance is rendered susceptible to the virus already present in the body.

Under symptoms and signs he says, "If one virus is responsible for such a variety of lesions as herpes simplex corneae, superficial punctate keratitis, nummular (or macular) keratitis, dendritic ulceration, disciform keratitis, some forms of neuropathic keratitis, and perhaps also keratitis profunda, it must be capable of very varied behavior at different times and in different places." LESLIE L. MCCOX, M.D.

MOUTH

Freidel, Arnulf, and Angielowicz: Traumatic Craniofacial Dislocations (Les disjonctions cranio-faciales traumatiques) *J. de chir*, 1937, 50 27.

Craniofacial dislocation, or separation of the superior maxilla from the skull, is a frequent lesion, the authors having observed, treated, and followed-up 15 cases within a short period of time. Several anatomical facts should be remembered in connection with this lesion:

1. The area is well vascularized, healing is rapid, union is firm, and non-union does not occur.

2. There are few muscle attachments; therefore secondary displacements do not occur.

3. The upper jaw is in intimate relationship with the accessory nasal sinuses, the orbit, and the cranial cavity.

4. The track or line of the fissure or fracture is relatively constant, as it is conditioned by the lines of weakness. Figures 1 and 2 show this more clearly than it can be described.

The injury occurs as a result of violent traumatism. Clinically, the patient is frequently in a state

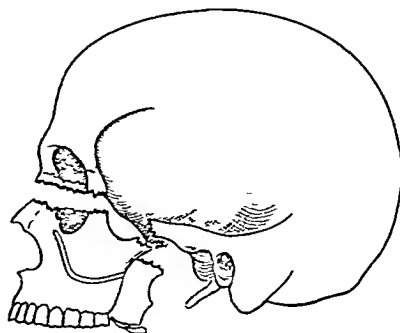


Fig 1 Profile

ABSTRACTS OF CURRENT LITERATURE

SURGERY OF THE HEAD AND NECK

EYE

Hughes W L. A New Method for Rebuilding a Lower Lid. Report of a Case. *Irish Ophth* 1937 17 1008

The type of operation described is applicable in any case in which a new lower lid structure is necessary for repair of a traumatic injury in cases in which the lid structures have been destroyed or mutilated and for reconstruction of the margins of the lid in cases of chronic degenerative conditions in which there is deformity or destruction of the lashes and lid structure and new lashes are necessary for the upper and lower lids as in severe cases of ulcerative blepharitis. The resulting lashes are better than when transplanted directly to the margin of the lid.

When one half or more of the lid must be reconstructed this procedure becomes the operation of choice only the temporal or the nasal portion of the upper tarsus is utilized.

The procedure may be used also for reconstruction of an upper lid the lower lid being used in the same manner as the upper is now used with an additional insertion of a thin piece of cartilage or tarsus from the opposite upper lid to furnish the rigidity normally furnished by the tarsus. There would be in sufficient tarsus in the lower lid for both lids.

Transplantation of the tarsus with its conjunctiva from the fellow eye would be feasible when structures are not readily available in the ipsilateral lids.

The advantages of the procedure are

1 No additional scars are made in the process of the reconstruction

2 In the new lid most of the normal structures are represented

3 The function and appearance of the normal lid are fairly well imitated

4 The margins of the lids close during sleep

5 The action of the upper lid is not hampered

A case is reported in which an epithelioma involving the entire lower lid was present which necessitated its complete removal. A new method of reconstruction of the lower lid was used the cosmetic and functional results were satisfactory. The upper lid was split into two layers transversely. The inner layer composed of the tarsus with the levator attached to its upper border was pulled down and was attached to the conjunctiva in the lower fornix. The skin of the cheek was undermined pulled up and united to the anterior surface of the tarsus so that its upper border occupied a transverse position midway between the upper and the lower border of the tarsus. This procedure resulted in complete closure of the conjunctival sac except for the medial canthus.

One month later a row of hairs was transplanted from the opposite eyebrow to the anterior surface of the tarsus just below and parallel to the upper row of lashes. A pressure dressing was applied and not disturbed for a week.

Three months after the original procedure a transverse incision was made between the two rows of lashes. A complete new lower lid was then present.

In resumé the skin was undermined and drawn up from the cheek the tarsus with its conjunctiva was drawn down from the upper lid and the lashes from the opposite eyebrow were transplanted.

The eye which was normal was at no time endangered.

Twelve operations of this type have been performed to date.

LESLIE L. MCCOY M.D.

Hagedoorn A. Adenocarcinoma of a Meibomian Gland. Report of Additional Cases. *Irish Otolaryngol* 1937 18 50

Adenocarcinoma of the meibomian glands may resemble a chalazion in the early stages and it would seem wise to examine a chalazion histologically if it has a somewhat unusual consistency. Adenomas in this location are not as rare as might be supposed. They are a special variety of carcinoma consisting chiefly of bands of sebaceous mother cells and sebaceous cells or at times of solid masses of sebaceous cells cysts and papilloma like growths.

WILLIAM A. MANN M.D.

Wright R E. Keratoplasty. *Brit M J* 1937 1 1311

It is undesirable here to go into all the variations that may have to be adopted if the condition of the recipient's eye is other than that suggested in the article for instance in leucoma adherens with shallow or non-existent anterior chamber and the whole gamut of abnormal conditions in the anterior segment which follow gross corneal ulceration. There are a few points of general interest and practical importance which may be noted.

A cornea that has previously been vascularized for example one which has been affected by interstitial keratitis or trachomatous pannus offers better soil for a graft than a cornea free of such old vessels. This has been known for a long time and is referred to by Elschnig.

A child is a much more difficult subject for keratoplasty than an adult.

It is important to respect Descemet's membrane it readily lifts buckles and detaches at the cut edge.

Anterior synechiae are liable to form in this situation. They are almost certain to be followed by opacification of the graft unless very trivial and

always resected as a large majority of recurrences arise from this portion. The indications were absolute and relative. Goiters which produce pressure or threatening conditions because of their size or position with regard to the neighboring organs, as the larynx, trachea, esophagus, nerves, or vessels, must be resected. The operation may become an urgent one if the goiter is rapidly increasing in size as malignancy may be present; it becomes urgent if hemorrhage occurs in the cysts, if there be an impacted mediastinal gland, tracheal collapse, or marked thyroiditis. A further indication is the thyroid heart, dyspnea, or thyrotoxicosis. Newer indications are cardiac decompensations and stenocardia. The author recognizes the cosmetic indication although he considers it relative.

The dangers of the operation are suffocation and hemorrhage. A complete revision of the wound cavity at the end of the operation is stressed to avoid overlooking an intrathoracic segment or leaving a sponge in the wound; the latter can have serious consequences, such as tracheal perforation or purulent bronchitis. Rare forms of goiter are the retropharyngeal, the intratracheal, and the lingual. The author refers to some complications, as embolism from thrombosis, which is uncommon, and air embolism, which is especially dangerous in the presence of a patent foramen ovale, as this anomaly permits an air embolus to the brain. The author, in contrast to other writers, only rarely encountered parathyroid tetany, which he believes is accounted for by the care with which patients were selected for operation. When tetany did occur, it was treated by the use of calcium, parathormone, and the transplantation of the parathyroid bodies. Paralysis of the recurrent nerve were present in 6 per cent of the series, the hoarseness, however, usually disappeared within the course of several months, as the nerve recovers if it has not been completely transected, or its fellow takes on a compensatory function. The author does not believe it necessary to warn the patients of the possibility of hoarseness or other complications. The author has never observed postoperative myxedema, as the total thyroidectomy was never done, and as he gave thyroid-gland extract until the critical period had passed and the remaining part of the gland could take over the function.

Additional complications are caused by the heart. In the mortality statistics, the thyroid heart played an important part. Therefore, an electrocardiogram is important before surgery is undertaken. Heart failure may take place during the operation, but usually it occurred in the hours following operation. It must be treated energetically with cardiac and vascular stimulants as well as by inhalations of oxygen. Pulmonary complications were common and were best treated by transpulmin. The author's mor-

tality including cases of thyroid heart or thyrotoxicosis was 1 per cent, and the recurrences were 2 per cent. A permanent result in cases of malignant thyroid could be attained only in the early stages of the condition. Heroic interventions were not done; the gland was partially removed, and this procedure was followed by roentgen therapy.

The author found Basedow's goiter in 8 per cent of his cases. Operative intervention in Basedow's disease, not considering disturbances brought on by the condition itself, was done only after several weeks of medical care had been useless. The operation was contra-indicated if the myocardium or the kidneys were badly damaged. The operation of choice was bilateral enucleation-resection. Total and subtotal thyroidectomy was not favored by the author because of the resulting myxedema. He did not perform any resections of the sympathetic nerves, and only in a few cases a reduction of the thymus was made. He found no worthwhile results from such a procedure. In very severe cases he performed superior polar ligations, which were followed in from two to three months by thyroidectomy. The author operated in thyrotoxic cases only under local anesthesia, and, because of poor results, did not use iodine pre-operatively. His preparation consists in two weeks of absolute rest with dietary control, or until the psychic irritability and motor unrest have subsided considerably. Special attention is given to the cardiovascular system. The main danger in operation for Basedow's disease is the postoperative reaction which usually sets in immediately or a few hours after the operation, with irritability, delirium, unrest, stupor, a rising fever up to 40°, and a pulse rate which may exceed 200. This reaction reaches its highest point in the first twenty-four to forty-eight hours, after which time it may abate or lead to death under the appearance of heart insufficiency. Fortunately, this reaction can usually be controlled by the liberal use of sympatol and caffeine in combination with 5 per cent glucose solution, these are given subcutaneously or intravenously in large doses, and supplemented with oxygen inhalation.

Psychotherapy is almost as important as medicinal therapy. Some authors prefer to keep their patients in a twilight sleep with pantopon or modiscop for forty-eight hours postoperatively. The author's mortality is about 2 per cent and the complete cures number about 85 per cent. The author believes that the high percentage of partial and complete failures (15 per cent) is due to the damage which the disease has produced in other vital organs, such as the heart, liver, pancreas, kidneys, and adrenal glands, before the thyroidectomy was done. On the basis of his experiments the author emphasizes the importance of early operation, especially for Basedow's disease.

(M. HIRSCH) WILLIAM C. BECK, M.D.



Fig. 2. Line of fracture in craniofacial dislocation.

of shock with multiple contusions, abrasions or lacerations of the face. Often he is in coma or is stuporous because of associated trauma to the brain. At such a time the craniofacial disunion may be overlooked and discovered only later when the patient himself finds difficulty in mastication. To discover the lesion in the acute state the head of the patient is held firmly by the temples with one hand while with the other the upper jaw is grasped and abnormal mobility is tested. At times the patient himself observes abnormal mobility in trying to open and close the mouth. In nearly all cases there is malocclusion of the incisors when the molars are in contact. There is a false prognathism caused by abnormal recession of the upper jaw not by actual protrusion of the lower. A fracture separating the two superior maxillae occurs occasionally. Secondary manifestations such as repeated epistaxis, otorrhagia and epiphora may be present. The roentgenological examination both lateral and in profile usually shows the fracture quite clearly.

The diagnosis can be made easily if the lesion is suspected and sought. If not complicated by meningitis or cerebral injury the prognosis is good. If there is no displacement a bandage holding the jaws together is sufficient. If displacement exists reduction must be made or malocclusion will result. Reduction should be made as early as possible as it is easiest at that time. After the reduction is accomplished it may be maintained by attaching an appliance which is held by a plaster skull cap. It is much better however to use the lower jaw as a splint by wiring the teeth according to Ivy's method. The wiring is released after eight days to test the mobility of the fractures but is restored until union occurs which usually takes from one to two months. Semi-solid or liquid food must be taken. By such treatment the results are excellent. It is applicable to all cases in which teeth to wire are present. In those cases in which the lesion was unrecognized early and in which union has occurred in malposition the treatment is quite difficult. Double resection of the lower jaw may be necessary but is never entirely

satisfactory. The authors have had no cases of this sort. They believe that the diagnosis should be made and treatment instituted early.

M. M. ZERNINGER, M.D.

NECK

McClintock J. C. and Wright A. W. Riedel's Struma and Struma Lymphomatosa (Hashimoto) *Ann Surg* 1937 100 31

The authors believe, on the basis of 22 cases which they studied that struma lymphomatosa (Hashimoto) and Riedel's struma are separate entities and not as Ewing has stated, different manifestations of the same disease. The literature is reviewed and statistical comparisons are given of the cases collected from the literature by the authors, likewise those collected by Graham, and also the cases observed by the authors.

The authors cite as evidence in favor of the dual concept the following differences in the clinical picture.

Struma lymphomatosa affects an older age group. This fact the authors believe makes it difficult to accept the theory that the condition is a precursor of Riedel's struma. Struma lymphomatosa is always bilateral while Riedel's struma is frequently unilateral; it occurs in 30 per cent of the cases. Symptoms are present longer in struma lymphomatosa; recovery is slower and a greater number of patients suffer residual hypothyroid symptoms. It is believed from the pathological evidence that Riedel's struma is of an inflammatory nature while struma lymphomatosa is believed to be a lymphoid hyperplasia with degenerative changes in the epithelial cells of the acini.

Cases from the literature observed at intervals of from one and one half to two and one half years reveal no transition from one entity to the other. One of the authors' cases which was operated upon twice revealed the histological picture of struma lymphomatosa (Hashimoto) at both examinations. The second operation was done two years after the first.

Of the 22 cases studied by the authors 4 were designated as Riedel's struma, 4 as struma lymphomatosa (Hashimoto) and 4 as a peculiar type of chronic thyroiditis which may at some time prove to be a separate entity.

FRED S. MODERN, M.D.

Urban R. Experiences based upon 7500 Collet Operations (Erfahrungen auf Grund von 7500 Kropfoperationen) *Deutsches med. Wochenschr* 1937 1 201-230

The author operated with 36 per cent novocaine solution without adrenalin injecting this as a circumferential block and never as a paravertebral block. For ligation and suture material he used only silk or linen never catgut. He usually employed the Kocher collar incision. The operation of choice was enucleation resection. On each side normal thyroid tissue the size of a plum was left. The isthmus was

always resected as a large majority of recurrences arise from this portion. The indications were absolute and relative. Goiters which produce pressure or threatening conditions because of their size or position with regard to the neighboring organs, as the larynx, trachea, esophagus, nerves, or vessels, must be resected. The operation may become an urgent one if the goiter is rapidly increasing in size as malignancy may be present, it becomes urgent if hemorrhage occurs in the cysts, if there be an impacted mediastinal gland, tracheal collapse, or marked thyroiditis. A further indication is the thyroid heart, dyspnea, or thyrotoxicosis. Newer indications are cardiac decompensations and stenocardia. The author recognizes the cosmetic indication although he considers it relative.

The dangers of the operation are suffocation and hemorrhage. A complete revision of the wound cavity at the end of the operation is stressed to avoid overlooking an intrathoracic segment or leaving a sponge in the wound; the latter can have serious consequences, such as tracheal perforation or purulent bronchitis. Rare forms of goiter are the retropharyngeal, the intratracheal, and the lingual. The author refers to some complications, as embolism from thrombosis, which is uncommon, and air embolism, which is especially dangerous in the presence of a patent foramen ovale, as this anomaly permits an air embolus to the brain. The author, in contrast to other writers, only rarely encountered parathyroid tetany, which he believes is accounted for by the care with which patients were selected for operation. When tetany did occur, it was treated by the use of calcium, parathormone, and the transplantation of the parathyroid bodies. Paralysis of the recurrent nerve were present in 6 per cent of the series, the hoarseness, however, usually disappeared within the course of several months, as the nerve recovers if it has not been completely transected, or its fellow takes on a compensatory function. The author does not believe it necessary to warn the patients of the possibility of hoarseness or other complications. The author has never observed postoperative myxedema, as the total thyroidectomy was never done, and as he gave thyroid-gland extract until the critical period had passed and the remaining part of the gland could take over the function.

Additional complications are caused by the heart. In the mortality statistics, the thyroid heart played an important part. Therefore, an electrocardiogram is important before surgery is undertaken. Heart failure may take place during the operation, but usually it occurred in the hours following operation. It must be treated energetically with cardiac and vascular stimulants as well as by inhalations of oxygen. Pulmonary complications were common and were best treated by transpulmin. The author's mor-

talities including cases of thyroid heart or thyrotoxicosis was 1 per cent, and the recurrences were 2 per cent. A permanent result in cases of malignant thyroid could be attained only in the early stages of the condition. Heroic interventions were not done; the gland was partially removed, and this procedure was followed by roentgen therapy.

The author found Basedow's goiter in 8 per cent of his cases. Operative intervention in Basedow's disease, not considering disturbances brought on by the condition itself, was done only after several weeks of medical care had been useless. The operation was contra-indicated if the myocardium or the kidneys were badly damaged. The operation of choice was bilateral enucleation-resection. Total and subtotal thyroidectomy was not favored by the author because of the resulting myxedema. He did not perform any resections of the sympathetic nerves, and only in a few cases a reduction of the thymus was made. He found no worthwhile results from such a procedure. In very severe cases he performed superior polar ligations, which were followed in from two to three months by thyroidectomy. The author operated in thyrotoxic cases only under local anesthesia, and, because of poor results, did not use iodine pre-operatively. His preparation consists in two weeks of absolute rest with dietary control, or until the psychic irritability and motor unrest have subsided considerably. Special attention is given to the cardiovascular system. The main danger in operation for Basedow's disease is the postoperative reaction which usually sets in immediately or a few hours after the operation, with irritability, delirium, unrest, stupor, a rising fever up to 40°, and a pulse rate which may exceed 200. This reaction reaches its highest point in the first twenty-four to forty-eight hours, after which time it may abate or lead to death under the appearance of heart insufficiency. Fortunately, this reaction can usually be controlled by the liberal use of sympatol and caffeine in combination with 5 per cent glucose solution, these are given subcutaneously or intravenously in large doses, and supplemented with oxygen inhalation.

Psychotherapy is almost as important as medicinal therapy. Some authors prefer to keep their patients in a twilight sleep with pantopon or modiscop for forty-eight hours postoperatively. The author's mortality is about 2 per cent and the complete cures number about 85 per cent. The author believes that the high percentage of partial and complete failures (15 per cent) is due to the damage which the disease has produced in other vital organs, such as the heart, liver, pancreas, kidneys, and adrenal glands, before the thyroidectomy was done. On the basis of his experiments the author emphasizes the importance of early operation, especially for Basedow's disease.

(M. HIRSCH) WILLIAM C. BECK, M.D.



Fig 2 Line of fracture in craniofacial dislocation

of shock with multiple contusions abrasions or lacerations of the face. Often he is in coma or is stuporous because of associated trauma to the brain. At such a time the craniofacial disunion may be overlooked and discovered only later when the patient himself finds difficulty in mastication. To discover the lesion in the acute state the head of the patient is held firmly by the temples with one hand while with the other the upper jaw is grasped and abnormal mobility is tested. At times the patient himself observes abnormal mobility in trying to open and close the mouth. In nearly all cases there is malocclusion of the incisors when the molars are in contact. There is a false prognathism caused by abnormal recession of the upper jaw not by actual protrusion of the lower. A T fracture separating the two superior maxilla occurs occasionally. Secondary manifestations such as repeated epistaxis otorrhagia and epiphora may be present. The roentgenological examination both lateral and in profile usually shows the fracture quite clearly.

The diagnosis can be made easily if the lesion is suspected and sought. If not complicated by meningitis or cerebral injury the prognosis is good. If there is no displacement a bandage holding the jaws together is sufficient. If displacement exists reduction must be made or malocclusion will result. Reduction should be made as early as possible as it is easiest at that time. After the reduction is accomplished it may be maintained by attaching an appliance which is held by a plaster skull cap. It is much better however to use the lower jaw as a splint by wiring the teeth according to Ivy's method. The wiring is released after eight days to test the mobility of the fractures but is restored until union occurs which usually takes from one to two months. Semi-solid or liquid food must be taken. By such treatment the results are excellent. It is applicable to all cases in which teeth to wire are present. In those cases in which the lesion was unrecognized early and in which union has occurred in malposition the treatment is quite difficult. Double resection of the lower jaw may be necessary but is never entirely

satisfactory. The authors have had sort. They believe that the diagnosis made and treatment instituted early.
M. M. Z.

NECK

McClintock J. C. and Wright *
Struma and Struma Lymphomatosa) *Ann Surg* 1937 106 21

The authors believe on the basis of their study that struma lymphomatosa and Riedel's struma are separate entities as Ewing has stated different from the same disease. The literature statistical comparisons are given selected from the literature by the authors those collected by Graham and all served by the authors.

The authors cite as evidence in support of their concept the following differences in nature.

Struma lymphomatosa affects an entire gland the authors believe. This fact the authors believe must accept the theory that the condition of Riedel's struma. Struma lymphomatosa while Riedel's struma is lateral it occurs in 30 per cent of cases are present longer in struma recovery is slower and a greater residual by postthyroid symptoms from the pathological evidence that is of an inflammatory nature while struma is believed to be a lymphoid degenerative changes in the epithelium.

Cases from the literature observed from one and one half to two and reveal no transition from one entity to the other. The authors cases which was operated revealed the histological picture of struma lymphomatosa (Hashimoto) at both operations was done two years.

Of the 12 cases studied by the authors designated as Riedel's struma 4 as struma lymphomatosa (Hashimoto) and 4 as chronic thyroiditis which may prove to be a separate entity.

FRED *

Urban K. Experiences based on 100 Operations (Erfahrungen auf 100 Kropfoperationen) *Illen med* 1901 230

The author operated with 1/2 % solution without adrenalin inject subcutaneous block and never a block. For ligation and suture material silk or linen never caustic. He used Kocher collar incision. The operation enucleation resection. On each side the size of a plum was left.

KESSEL stated that the experimental production of a chronic subdural hematoma is not successful because the dura and arachnoid must be injured thereby and in this way an opening of vessels or spaces capable of resorption occurs. Inasmuch as in all operations on the brain both the hard and soft cerebral membranes are injured, and this is especially the case in most cerebral and skull traumas, subdural hematomas are almost never observed after operations, and their number is relatively small in comparison with the total number of traumas occurring.

LOUIS NEUWEIT, M.D.

Kroll, F. W.: Operations on Meningiomas (Operationen von Meningiomen) *6r Tag d. deutsch. Ges. f. Chir.*, Berlin, 1937

While the technique of operation on the well known psammomatous meningiomas, with their firm structure and capsule formation, is now pretty well understood and presents but few difficulties, the softer and more highly vascularized meningiomas of the brain still offer technical problems that are difficult to solve. In the first group of meningiomas, the tumor may be removed either *in toto* with its matrix as, for example, in the meningiomas of the falx, it may be excochleated and then its entire capsule may be removed together with the matrix, or the tumor may be removed in large wedge-shaped pieces. As the psammomatous tumors are firm, it is always possible, and not too difficult, to attack them surgically. The soft meningiomas which have many similarities to sarcomas, present a different situation. They are extraordinarily vascular and send vessels far into the adjoining brain tissue, in addition, they are not nearly so clearly demarcated from their surroundings, and lack a capsule, so that they grow into the surrounding brain tissue in pocket-form. Grasping such a tumor with the small forceps often causes it to fall to pieces with resultant copious bleeding. It is therefore readily understood that the technique in operating on these hypervascularized meningiomas is quite different from that already given. In the case reported the meningioma was of the size of a small apple and was situated in the region of the left temporal lobe, its matrix was derived from the transition of the petrous portion of the temporal bone to the mastoid. The tumor had displaced the entire ventricular system in a bizarre manner upward from the left to the right with complete suppression of the third ventricle. The clinical neurological examination showed, among other phenomena, the complete picture of motor aphasia with alexia, agraphia, and amusia, unilateral phenomena on the right, and a bilateral high-grade choked disc with homonymous left hemianopsia for white and all colors and reduction of vision on both sides to $\frac{5}{20}$. It is important to mention that in contrast to the usual cases of psammomatous meningioma with long anamnesis, in this case the very first symptoms appeared not earlier than three months before the beginning of the illness. The patient had been operated on for exophthalmic

goiter of moderate severity four months previously, and at that time there were no clinical symptoms to suggest that the nervous system was disordered or any indications of psychic disturbance. After the diagnosis was established, the patient was operated on in 1926. The operation, including exposure of the tumor, the location of which was in agreement with the neurological indications, was carried out in the usual manner. On the surface the left temporal lobe was only slightly attacked by the tumor. In some portions the tumor tissue was set off from the normal brain tissue by a bluish-reddish color, whereas in other portions it passed into normal tissue by indistinguishable transition stages. It was extraordinarily soft and spongy and enormously vascular. Blunt division from the temporal lobe was not possible, its attempt led to a large amount of bleeding from numerous small vessels which entered the normal brain tissue. For this reason the entire surrounding brain tissue had to be ligated first with fine sutures. Then the separation of the tumor from the surrounding tissue with the fine electric knife was begun. Thus, fragment by fragment, the entire tumor was removed, the attack on each fragment being preceded by ligation of the adjoining brain tissue, as described. The tumor penetrated far into the base of the skull and into the occipitotemporal region. The matrix of the tumor was inserted directly into the transition of the petrous portion of the temporal bone to the mastoid, so that the superior petrous sinus had to be ligated first. Then it was possible to remove the entire matrix, till the bare petrous portion of the temporal bone lay exposed. The significant features of the technique are the step by step ligation of the marginal portions of the adjacent brain tissue and the use of electrocoagulation alone in the resection of the tumor fragments. Today, six months after the operation, the patient may be regarded for practical purposes as completely cured. The sole remaining symptom consists of a slight difficulty in finding words in difficult technical expressions, foreign words, or words to express complex abstract ideas.

In conclusion, the author showed a new plastic repair of the dura, which seems to him to be particularly practical. Instead of a fascioplasty, a thin layer of the galea flap of the trepanation section, curved in shape, is carefully separated, and a broad base is left inferiorly. This separated portion of the galea is sutured firmly to the margins of the dura and forms an excellent dural substitute and closure, which heals very rapidly and smoothly. The operative technique described proved highly satisfactory in cases of vascular "sarcomatous" meningiomas.

FLORENCE A. CARPENTER

Turner, O. A., and Simon, M. A.: Malignant Papillomas of the Choroid Plexus. Report of Two Cases with a Review of the Literature. *Am J Cancer*, 1937, 30: 289.

The authors report two cases of malignant papilloma of the choroid plexus and review seventy pre-

SURGERY OF THE NERVOUS SYSTEM

BRAIN AND ITS COVERINGS CRANIAL NERVES

Travers J T Roentgenological Findings of Post Traumatic Sequelae of Head Injuries An Encephalographic Study *Radiology* 1937 28 704

An extensive review of the literature concerning encephalographic studies following head injuries is presented. The encephalograms from fourteen cases showing positive encephalographic findings are shown. Encephalograms were used in the study of post traumatic sequela to determine whether there was an actual brain lesion present to account for the subjective symptoms which otherwise might be designated as neurotic.

The author found that in a large percentage of such cases lesions were demonstrable by encephalography. He emphasized its special value in differentiating subdural hematoma from non surgical lesions.

ROBERT ZOLLINGER M D

Zuelch A J Rapid Histological Diagnoses of Brain Tumors at Operation (Histologische Schnelldiagnose von Hirnreschwuelsten bei der Operation) *dt Tag d deutsch Ges f Chir* Berlin 1935

In order to make a rapid diagnosis at the operating table the author has made use of the frozen section and creyl violet stain which method is simple fast and sufficiently reliable. The cases in which the method has been employed are discussed and photographs of the operation and the rapid section method are shown. The method has the peculiar advantage that tissue relationships are preserved and therefore the resulting picture closely resembles that produced by the section of larger amounts of tissue and prepared by the Nissl technique. The histopathological experiences with the lower method can therefore be immediately adapted for use in the more rapid technique. Later in the final diagnosis proof is possible by comparing the results with those of the routine staining method.

WILLIAM C BECK M D

Johnson V C and List C F Ventriculographic Localization of Intracranial Tumors 3 Tumors Involving the Posterior Part of the Third Ventricle and Thalamus *Am J Roentgenol* 1937 38 7

This report apparently the first of a series dealing with ventriculographic study of the brain is concerned with the distortion resulting from tumors encroaching upon the posterior portion of the third ventricle namely pineal gland tumors tumors of the thalamus intraventricular tumors such as teratomas or ependymomas and hypothalamic tumors. The technique of successful ventriculography is properly emphasized as well as the roentgenographic technique. Nine cases of intracranial tumors are

discussed and excellent line drawings are used to illustrate them.

JOHN MARTIN M D

Zehnder M Subdural Hematomas (Ueber subdurale Haeatomae) *dt Tag d deutsch Ges f Chir* Berlin 1937

At the Neurosurgical Division of Wuerzburg under the direction of Toernnis 51 cases of bleeding of the dura were observed. Nine were definite post traumatic subdural hematomas 1 was pachymeningitis hemorrhagica interna and 1 intradural hemorrhage after a trauma occurring a long time before. In 2 of the cases the cerebral symptoms appeared soon after a catarrhal infection with sinusitis. In 1 case trauma had occurred on the same side fourteen years before.

Because of the question of allergic hemorrhage after a former trauma of the dura animal experiments were undertaken in collaboration with Mueller of the Pathological Institute at Wuerzburg which produced fresh hemorrhages in the dura and the Schwartmann phenomenon in 2 cases two and one half months after the subdural injection of blood. These findings must be obtained further in a larger number of cases. Similar allergic factors may have a significance for a part of the pachymeningitic changes following traumatic hemorrhages of the dura as a hemorrhagic tissue reaction following local alteration (Schwartmann).

In the discussion STIEBA stated that the disease picture described under the name of subdural hematoma so closely resembles the pachymeningitis hemorrhagica interna described by Virchow in 1837 that the question arises whether there are not some close relationships to this disease. Since 1932 he had operated upon 5 such cases in which there were encapsulated collections of blood deposited in a pillow like fashion on the cerebral hemispheres with membrane formations on the inner side of the dura. A trauma was reported in the previous history of all of the cases but this alone cannot have given rise to the disease picture. Certain other prerequisites such as constitutional anomalies and vascular changes in the dura as a result of inflammation and intoxication must be fulfilled as otherwise the disease picture would be found much more frequently. Pachymeningitis hemorrhagica interna also is not found at autopsy in patients that died a long time after the operation on the brain (Doellmann). The disease picture should be called pachymeningitis hemorrhagica interna traumatica or according to the proposal of Heeschen pachymeningitis. The Americans Cushing Putnam Trotter Furlow and Gardner use the expression chronic subdural hematoma. The proper therapy is trephining not only suction from one or two bored holes. The 5 patients were cured in this manner and have again become fully able to work.

as sufficient exploration is usually not feasible at operation, also the tedium of a thorough autopsy for bony lesions may deter the examiner from making an adequate search, so that small zones of osteomyelitic bone may be overlooked. Moreover, the focus of bone change may be overshadowed by the impressiveness of the obvious purulent or granulomatous mass

JOHN MARTIN, M D

SYMPATHETIC NERVES

Page, I H, and Heuer, G J.: The Effect of Splanchnic Nerve Resection on Patients Suffering from Hypertension. *Am J. M Sc*, 1937, 103 820

The authors present detailed reports on nine patients suffering from hypertension in whom the splanchnic nerve had been resected. Six of them had essential hypertension, varying from mild to severe. These patients ranged from twenty-five to forty-eight years of age. One patient, twenty-five years of age, had early malignant hypertension and

the remaining two, between eighteen and twenty-five years, had severe malignant hypertension. None of these patients were harmed by the splanchnic-nerve resection.

The arterial blood pressure, although reduced following the operation, returned within six months to the pre-operative level in all the patients. There was subjective improvement, however, consisting of fewer and less severe headaches, ease from fatigue, nervousness, tenseness, and irritability in six of the cases with essential hypertension. Improvement was only transient in the cases of malignant hypertension. The authors were unable to find any change in renal efficiency following the operation.

There was no marked effect on the heart shown either by electrocardiographic or roentgen-ray studies.

The authors were not very enthusiastic as to the benefits to be derived from splanchnic-nerve resection on patients suffering from hypertension.

ROBERT ZOLLINGER, M D.

vously reported. The lesion occurred during the third decade of life in over 50 per cent of the cases. The age of the patients varied between three months and seventy-four years. The most common location of these tumors was in the fourth ventricle. The tumors varied in size from 1 cm. or less in diameter to masses which filled and distended the ventricles. They were usually well circumscribed although a capsule was not always present. Microscopically they showed a tendency toward reduplication of the essential structures of the choroid plexus.

In the authors two cases, this rather unusual tumor was situated in the third ventricle.

ROBERT ZOLLINGER, M.D.

Jefferson, G. The Removal of Right or Left Frontal Lobes in Man. *Brit Med J* 1933 2: 509.

Eight case histories, all of them brief and explicit are reported and discussed to depict the author's experience in partial removal of the frontal lobe. Jefferson modestly and wisely has not overdrawn his deductions from his cases. Six of his patients are living and well and two died of intercurrent disease. The author is prompt to recognize some of the fallacies in modern conceptions of frontal lobe function. His cases include operations upon both the left and the right lobes, not in the same patients and he believes that neither lobe is predominant. He recognizes of course that once a lesion on the left side begins to go back behind the limit of the true association or silent area there is a probability of speech damage and this is probably the basis for the doctrine of left lobe predominance. To support this view he quotes Hyland and Botterell's analysis of clinical material pertaining to this subject.

Jefferson finds two facts of especial interest in his cases: first, those patients showing no mental alteration preoperatively were unaffected by partial removal of the frontal lobe and second, those having mental symptoms were much better after the diseased lobe was excised. Therefore, from the removal of a large quantity of neural tissue in such operations and the resultant sufficient intelligence in these patients for the pursuit of normal life, it seems obvious that the frontal lobes are far from being the organ of mind and while Jefferson and anyone else will deny the function of the frontal lobes in intellectual and emotional processes it is clear that the entire cerebral cortex and not one locus is a functioning whole in the so-called higher association patterns. Improvement in the mental status of a patient from whom a frontal lobe tumor was removed may be due to the decompressive effect or to the removal of a noxious growth the same as would result from the same procedure in any other part of the brain.

Jefferson's lobectomies, like those of other operators are only partial resections, a fact which he clearly shows by line drawings illustrating each of his cases. Naturally no surgeon would remove the whole frontal lobe. The lines of section in Jefferson's cases, seven of which presented tumors and one of

which presented a cluster of calcified cysts, started below immediately anterior to the sylvian point and the lesser wing of the sphenoid in order to avoid the insula and the middle cerebral artery. From there the line was carried upward to the midline. The author points out that while technically the procedure is not too formidable yet it is not a matter to be carried out without consideration of the possible after effects. It is to be performed only in the face of necessity.

JOHN MARTIN, M.D.

SPINAL CORD AND ITS COVERINGS

Browder, J. and Meyers, R. Infections of the Spinal Epidural Space. An Aspect of Vertebral Osteomyelitis. *Am J Surg* 1937 37: 4.

Using 7 well selected case histories as the basis of their report the writers describe what to them is the typical symptomatology, clinical course, and pathology of infections of the spinal epidural space. Infections by extension from adjacent pathological soft tissues are not considered because the pathogens in such cases is easily enough understood. Direct invasion of the spinal epidural space by a septic metastasis by the hematogenous route is the commonly accepted origin of this second type of lesion but Browder and Meyers are of the opinion that such primary metastatic infection is secondary to an already existing focus of spinal, vertebral or rib osteomyelitis.

Their cases fall into two groups, those consisting of an acute inflammatory process, a true epidural spinal abscess with free pus and those of a low grade, chronic inflammatory lesion on a spinal epidural granuloma characterized by the presence of old sclerosing granulation tissue filling the epidural space. Such a classification corresponds to the ones already in the literature pertaining to this subject.

The clinical picture is constant enough to present a definite syndrome, especially in the acute type of abscess, a history of previous infection such as upper respiratory infection, tonsillitis, otitis, pneumonia, cellulitis in any place in the body, or furunculosis, severe boring pain in the spine localized and increased by straining, symptoms of toxemia such as fever, headache, leukocytosis, the positive Brudzinski sign, radicular pains and finally fairly rapidly advancing neurological signs of spinal cord involvement. These findings together with a study of the spinal fluid which usually shows a xanthochromic pleocytosis, increased protein, normal sugar and sterile culture and a finding of complete or incomplete subarachnoid block practically determine the diagnosis and certainly indicate the necessity of surgical intervention.

The authors are not the first to suggest that spinal epidural abscess is usually secondary to an osteomyelitis rather than being a primary metastatic lesion. They make an important statement to the effect that negative operative findings of bone change are no proof of the absence of osteomyelitis.

so soft as to resemble soap bubbles. They varied in position, size, and number.

The outcome in general was favorable, the physical signs disappeared in from fifteen to twenty days and the patient recovered in about a month.

Occasionally there was hemorrhage into the pleural space from rupture of the bullæ. Chronic, recurrent, and bilateral types were sometimes observed.

Active tuberculosis was not found to be a causative factor in this condition, but numerous authors have inclined to the belief that benign spontaneous pneumothorax may be the first evidence of a latent tuberculosis. Histological and anatomical studies, however, do not confirm this view, but emphasize the importance of the subpleural vesicles first described by Bouillard about one hundred years ago and by Watson in this country about the middle of the nineteenth century. Their origin is inflammatory or the result of congenital malformation. Thorascopic examination permits direct inspection of the lesions.

MARSH W. POOLE, M.D.

Armand-Delille, P. F., Lestocquoy, C., and Huguenin, R.: Cystic Appearance of Dilatation of the Bronchi (Les aspects kystiques de la dilatation des bronches) *Ann. n. d. chir.*, Par., 1937, 2: 133.

In the course of study of tuberculosis and other diseases of the respiratory tract the authors have seen typical cylindrical or fusiform dilatations of the bronchi, and in addition they have seen round forms. The former might have been caused by subacute or chronic inflammations, but the latter did not seem to be due to inflammation, and the authors think it probable that they were congenital in origin. They describe a number of cases and present roentgenograms and photographs of pathological specimens. The roentgenogram and anatomical specimen of one such case are reproduced.

Only a clinical study and roentgen examination with lipiodol were made in some of these cases and in others autopsy and histological examinations were made. The congenital origin of the dilatations resembling cysts seemed to be beyond doubt as the histological appearance was not that of a bronchus dilated and modified by inflammation, nor that of lung tissue affected by inflammation or abscess. It was the abnormal bronchial and pulmonary tissue which suggested dysembryoplasia.

The inflammatory changes seen around the cavities were not sufficient to explain the growth of the cystic cavities. While some of the cavities were chronically inflamed there were others as large, around which there was no inflammatory reaction. The cysts seemed to be sites of predilection for infections, particularly tuberculosis, but infection did not play the essential part in the growth of the cysts. The progressive development of these cysts could be explained much better on the theory of embryonic dysplasia. On this theory these changes were analogous to congenital cystic disease of the kidney. These polycystic lesions of the kidney may become enormous without inflammation.



Fig. 1. Congenital bronchiectasis of cystic appearance in the right and left lower lobes after the injection of lipiodol.



Fig. 2. Anatomical specimen of the same case as shown in Figure 1.

Because of the danger of attacks of inflammation in these cysts and their tendency toward progressive increase in size, surgical treatment seemed to be indicated. In some cases the authors had splendid results with therapeutic pneumothorax by Rist's method.

AUDREY GOSS MORGAN, M.D.

SURGERY OF THE THORAX

CHEST WALL AND BREAST

Bittner J J Mammary Tumors in Mice in Relation to Nursing *Am J Cancer* 1937 30 230

The author reports further observations of the effects of nursing on mammary gland tumor incidence in mice. In the experiments reported the young born to females with high breast tumors were removed as soon as recorded and fostered by females of low tumor lines. Only one generation of high tumor lines was fostered by mice of low tumor lines. In succeeding generations the progeny were nursed by their mothers with high tumors. Only breeding females were included in the report.

Mice of the fostered series lived on an average of three months longer than control mice of high tumor lines fostering one generation of low strain lines was the only difference between control animals and the experimental group.

The progeny of three generations totaling 91 of one group of 9 fostered females were observed. Of these 23.1 per cent developed breast tumors while 83.2 per cent of the controls developed breast tumors. One third of the fostered first generation of mice developed mammary gland tumors. The incidence of mammary tumors among the progeny of this one third (20 progeny) was 60 per cent. The author states that the occurrence of some mammary tumors among the fostered females may have been due to the nursing of the mothers with high cancer during the first day of life. Some of the young may have obtained sufficient milk to initiate the development of breast cancer before being removed to their foster mothers.

Three females of low tumor lines fostered by females of high tumor lines developed carcinoma of the breast and one mouse of the next generation developed a tumor of similar type. These four tumors occurred in a small group of about 25 while in the control group only 3 such tumors developed in several hundred breeding and virgin females.

The author concludes that these experiments indicate that some influence is transmitted through the mother's milk which is of prime importance in determining the incidence of breast tumors. The work may offer an explanation for the extrachromosomal influence on the development of breast tumor.

PART O L STENGER M D

Cramer W On the Etiology of Cancer of the Mammary In the Mouse and in Man *Am J Cancer* 1937 30 318

The author briefly reviews the experimental evidence of carcinogenic factors for the skin and the mamma of the mouse. These two types of experimental carcinogenesis have an essential dissimilarity whereas in cancer of the skin the carcinogenic environment is partly internal and partly external

in cancer of the mamma all the 'carcinogenic factors' can be found within the organism. The carcinogenic agent in the experimental carcinogenesis of the mamma is a substance produced by the body and an inherent susceptibility which is restricted to the mamma and does not extend to the skin plays a very important part in determining the onset of the disease.

The author then refers to the statistical investigations on the familial incidence of cancer by Waaler of Norway and by Wassink in Holland. According to these studies the risk is a very high familial incidence of cancer of the mamma and a relatively low familial incidence of cancer of the lip. From this the author infers that an internal carcinogenic environment plays an exceptionally important part in the cause of cancer of the mamma in man as well as in mice. As this internal carcinogenic environment in mice is associated with abnormalities of the endocrine system referring particularly to the estrogenic hormone the author is of the opinion that a search for such abnormalities in women with cancer of the breast and a family history of cancer of the breast is indicated.

ARTHUR OCHSNER M D

TRACHEA LUNGS AND PLEURA

Caster M and Wazzei E S Benign Spontaneous Pneumothorax from Rupture of Subpleural Bullae: A Study of Twelve Cases (*Le pneumothorax spontané et bénin par rupture des bulles sous-pleurales: considérations sur douze cas et leur interprétation étiopathogénique*) *Arch int méd* 1937 13 25

The authors present the case histories of 12 patients all male who had experienced a spontaneous pneumothorax. Six were between twenty and twenty five years of age, 3 between twenty six and thirty, and 3 between thirty and thirty five years of age. In some the pneumothorax came on while the subject was resting, in others while he was walking or after he had been slightly or intensely active. Clinical symptoms appeared suddenly or insidiously. The primary symptoms were pain and dyspnea. Palpitation, cold sweats, cyanosis, nausea and vomiting were present in some cases, all without fever. Pain varied both in intensity and duration. The pain localized over the chest simulated angina or was referred to the abdomen. Physical signs were dependent upon the amount of air in the pleural cavity. The heart was more or less displaced. Usually the pneumothorax was complete as shown by roentgenograms. The intrathoracic pressure was negative or oscillating close to 0. Occasionally it was positive as much as plus 10.

X-ray examination revealed what the authors described as bullae of air beneath the pleura. They were shown as faint annular shadows with borders

those who refuse collapse therapy, or who leave the sanatorium for various reasons before collapse therapy is instituted. They believe that collapse treatment should be applied to the non-cavernous as well as to the cavernous cases as it has definite prophylactic value with regard to cavity formation.

RICHARD H. MEADE, JR., M.D.

Durand, H.: Abscess of the Lung. An Anatomico-pathological Study (Les abcès du poumon. Étude anatomo-pathologique) *Arch. méd.-chir. de l'appar. respir.*, 1936, 11: 474.

In discussing the historical aspects of the literature on pulmonary abscess, Durand points out the fact that few references are to be found in the writings of the older clinicians. Charcot made no mention of it, while others dismissed the subject with a few lines. Bayle, Cayol, and Franck first differentiated between empyema and pulmonary abscess. Laennec described pulmonary gangrene and wrote of abscess as follows, "There is no rarer lesion than a collection of pus in the pulmonary tissue."

In defining lung abscess, Durand excludes suppuration in hydatid or congenital cysts, cavitation in carcinomas or cardiac infarcts, peribronchial suppuration, and gangrene.

The author believes that a more up-to-date classification of pulmonary abscess must be evolved to replace the old and purely clinical classification of Jaccoud. He distinguishes two principal groups: (1) odorless abscesses and (2) putrid abscesses. The former is divided into three sub-groups: (a) parasitic abscesses following amebic dysentery, (b) pyogenic abscesses, and (c) Friedlander's abscesses. Putrid abscesses are secondary to aspiration of foreign matter, emboli from puerperal or gastro-intestinal infection, and ulceration of the esophagus. The acute type is characterized by destruction of tissue, the more chronic types are characterized by sclerosis.

Amebic abscesses may occur without associated hepatic abscess. They are found in the right lower lobe and may be large enough to destroy the entire lobe. The pus is white or rose-colored and contains an abundance of polynuclear cells, desquamated cells, and macrophages. Such abscesses are usually solitary. When there is no associated liver abscess it is assumed that the ameba pass to the lung by the transdiaphragmatic lymph channels.

Of the pyogenic abscesses, the septicopyemic usually arise as a result of septicemia due to infectious endocarditis or infections caused by staphylococci, streptococci, or other bacteria. They are likely to be multiple and of small size. Spontaneous cure is possible if the septicemia is controlled. Abscesses following pneumonia are quite uncommon, but when they occur they are usually single. In size they vary from that of a pea to that of a hen's egg, and they are filled with creamy pus. Occasionally they rupture into a bronchus, or into the pleural or pericardial cavities. Bronchopneumonia abscesses develop from bronchopneumonia caused by whooping

cough, measles, and bronchitis in children. Influenza and war gas are also frequent causes. One characteristic of this type is the multiplicity. Usually the abscesses are of small size. Operations for removal of the tonsils or adenoids frequently precede bronchopneumonic abscess. Streptococcal abscesses usually follow infections of the mouth and nasopharynx, or operations in these areas. They may also result from post-abortion infection or suppurative phlebitis. Occasionally they arise as a primary condition. They vary in size, some being quite large and filled with pus or clotted material.

Friedlander's abscess is classed separately because the pneumobacillus causes extensive destruction of the pulmonary tissue. Sometimes this type of abscess is of such enormous size that only a shell of sclerosed pulmonary tissue remains. The pus has a rather disagreeable odor, which helps to distinguish it from that of a pyogenic abscess, yet it is not nearly so offensive as that of the putrid abscess.

MAPSH W. POOLE, M.D.

Pressman, J. J., and Emery, C. K.: A New Method of Radium Application in Cancer of the Bronchus. *Ann. Otol., Rhinol. & Laryngol.*, 1937, 46: 314.

The authors state that the radium tubes used in the treatment of cancer of the bronchus are 10 cm. in length and from 6 to 9 mm. in diameter; they must lie in the bronchus from thirty to sixty-five hours. This large foreign body in the bronchus for so long a period of time causes obstruction of the flow of air which in turn causes massive collapse of the lung.

Preliminary pneumothorax is a new method to overcome this disadvantage. The authors list this method as the method of choice because the technique is simple and relatively safe; it provides adequate carefully measured radium dosage with radiation of equal intensity throughout all portions of the tumor, and radiation of healthy tissue above, below, and around it.

JAMES C. BRASWELL, M.D.

Michetti, D.: Problems in Resection of Adhesions (Considérations sur la section d'adhérences) *Arch. méd.-chir. de l'appar. respir.*, 1937, 12: 145.

The unfavorable effect of adhesions in pneumothorax therapy is well known. Not only is the complete collapse of the lung hindered thereby, but the injurious effect of respiratory movements on the pulmonary lesion is increased. The traumatic effect of the latter is greater, the smaller the diameter of the adhesion. Lesions in the vicinity of an adhesion may become exacerbated by its irritative effect so that it becomes necessary either to resect the adhesion or to discontinue the pneumothorax.

In some cases an elongation of the adhesion occurs, at the expense of the lung tissue, which undergoes a sort of ectasia. It is well known that occasionally a hypotensive Forlanini operation will give better results than a forced pneumothorax. Failure of the forced pneumothorax may result from stretching of an adhesion, perhaps invisible, even radiologically,

Izzo R A Aguilar O and Irigoyen L. Epitheliomatous Degeneration of a Tuberculous Cavity. Microscopic Diagnosis (Degeneración epiteliomatosa de una caverna tuberculosa. Diagnóstico microscópico). *Semana med* 1937 44 58r

It was formerly thought that there was an antagonism between tuberculosis and cancer. This was believed only because the two diseases ordinarily occur at different ages: tuberculosis in the young and cancer in the aged. Since microscopic examinations have been made more frequently it has been found that the two diseases may and not infrequently do coexist.

The authors describe a case in a man fifty years of age who had suffered for years from progressive tuberculosis but had never shown any clinical signs of cancer. In the terminal stages of the disease however he began to have recurrent and uncontrollable slight hemorrhages ending in a copious hemorrhage which caused death. For the sake of determining the cause of these hemorrhages microscopic examination was made of the walls of the tuberculous cavity in the lung. This examination showed the beginning stage of cancerous degeneration of the wall. The tumor was a prickly celled epithelioma with horny pearls. It apparently had no connection with the wall of any bronchus but the author is inclined to think it must have originated from epitheliomatous degeneration of some small bronchus included in the wall of the cavity and was probably caused by chronic irritation due to cell metaplasia.

It is probable that this association of cancer and tuberculosis exists in other cases in which microscopic examination is not made and in which the malignant degeneration has not advanced far enough to cause clinical symptoms. ALBNEY GOSW MORGAN M D

Blasini A. A Contribution to the Study of the Anatomical Behavior of the Heart in Pulmonary Collapse Therapy. (Contributo allo studio del comportamento anatomico del cuore nella Ristrutturazione collapso-terapia polmonare). *Arch ital di chir* 1937 45 40r

The rabbit was used for this study. The author performed all the common operations used in collapse therapy and studied the histological changes of the heart at varying intervals. He concludes that except in hypotensive pneumothorax dilatation muscular thickening and histological changes indicating definite myocardial damage occur in the left ventricle in all types of operations. In view of these findings he warns that patients be carefully selected before they are subjected to collapse therapy. DAVID IMPASTATO M D

Leslie G L and Anderson R S. Intensive Collapse Therapy in Pulmonary Tuberculosis. II. A Study of the Indications and Use of Various Operative Procedures in a Group of 124 Patients. *Am J of Sc* 1937 194 x

In a previous article Leslie and Anderson reported on the final results of treatment of a series of 124

patients with the adult type of pulmonary tuberculosis admitted consecutively to the Michigan State Sanatorium in Howell between June 1 1930 and June 30 1934. Nearly 80 per cent of these patients had some form of collapse therapy. Cavity closure was secured in 71.5 per cent and the sputum was rendered negative in 71.8 per cent. The present article deals with the indications for and the actual use of the various methods of collapse therapy employed.

Although pneumothorax therapy was induced in 48.2 per cent of the entire group it was used alone in only 8.3 per cent. Bilateral pneumothorax was employed in 83 patients or about 8 per cent of the entire group.

Phrenic nerve surgery was used in 66.4 per cent of the series and as the sole procedure in 23.1 per cent. Together with pneumothorax it was considered as all that was necessary in the form of collapse therapy for 48 of the 52 mild cases treated.

Intrapleural pneumonolysis was performed on 80 patients representing 34.7 per cent of all patients receiving artificial pneumothorax therapy. Open operation was resorted to in 19 cases.

Extrapleural pneumonolysis with plombage was used in 57 patients 5 per cent of the entire series. Except for a temporary expectoration of small quantities of paraffin in several patients no untoward results were noted. The posterior approach was found to be the preferable one.

Supraperitoneal pneumonolysis with its extremely limited indications was used in only 4 cases.

Multiple intercostal neurectomy has been used only in patients with unstable unilateral or bilateral disease for whom other collapse measures have been ineffectual and for whom thoracoplasty is contra-indicated at the time. The results of this treatment alone or for preparing the patient for a later thoracoplasty in the 15 cases in which it was used have been so good that the authors consider it indispensable in its very limited application. The operation is now done routinely in two stages.

Scaleneotomy is thought to be of value chiefly as an adjunct to multiple intercostal neurectomy in unstable cases in which the primary object is to secure as much immobility of the hemithorax as possible in preparation for later thoracoplasty. It was used in 20 patients.

Thoracoplasty was considered necessary in only 116 patients 10.3 per cent of the entire group or 13.1 per cent of those receiving collapse therapy. This fact is of significance when it is recalled that 80 per cent of the entire group were submitted to some form of collapse therapy and 60 per cent presented far advanced cases. The authors attribute this low figure to the utilization of the less radical collapse procedures.

The authors believe that collapse therapy should be instituted in all patients admitted to a sanatorium with the adult type of active pulmonary tuberculosis with the exception of those with terminal cases those with questionable activity of the lesions and

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Bachy, G : Hernia Through the Semilunar Line of Spiegel (Hernie dite de la ligne semi-lunaire de Spiegel) *Rev de chir*, Par, 1937, 56 201

A case history with operative findings is reported of an adult male who suffered from a strangulated hernia through the semilunar line of Spiegel. This man had noticed a small mass in the abdominal wall for about twelve years. On the day of operation he presented the signs of intestinal obstruction with a painful swelling in the abdominal wall just external to the rectus abdominis on the left side on a line running from the umbilicus to the left anterior superior iliac spine. At operation the protruding intestinal mass was found to be a portion of the transverse colon with its mesentery. The hernial protrusion was through the aponeurotic space external to the rectus abdominis along the line of insertion of the transverse and oblique abdominal muscles.

The distribution of this type of hernia is about equal in males and females, most often the patient is between thirty-five and forty years of age and gives a history of a tumor mass persisting for a long period of time.

Bachy gives the details of his method of reduction of the hernia and closure of the abdominal wall.

MARSH W POOLE, M D

GASTRO-INTESTINAL TRACT

Toupet, R, and Mouchet, A : Considerations on Benign Hypertrophic Pyloric Stenosis in the Adult (Considérations sur la sténose hypertrophique bénigne du pylore chez l'adulte) *J de chir*, 1937, 50 1

In this review of the subject of benign hypertrophic pyloric stenosis, the authors present the case history of a female patient aged fifty-three years who had complained of increasingly frequent attacks of vomiting over a period of about twenty-three years. Epigastric pain had been felt at intervals for about three years. Vomiting usually followed the pain, most often about ten o'clock in the morning and four o'clock in the afternoon. There had never been any blood in the vomitus. During the last eighteen months of her illness, the patient had lost twelve kilos. At operation, the pylorus and about 4 cm of the adjacent portion of the stomach were found to form a hard tube which could not be dilated.

From the literature it would appear that benign hypertrophy of the adult pylorus is more frequent than is commonly believed. An extensive list of references both from French and foreign journals are given.

The hypertrophy may be of two types:

1 The more unusual, when it is due to pure muscular hypertrophy, probably congenital in origin,

despite the late appearance of symptoms. It is readily corrected by simple plastic operation.

2 Hypertrophy and stenosis due to sclerosis. This type is a result of an infectious process possibly related to more obscure underlying causes, such as pyloric spasm or congenital predisposition.

Whatever the clinical picture may be or whatever the appearance of the condition at operation, it is impossible to eliminate the possibility of cancerous infiltration until a microscopic examination is made. Therefore gastropylorotomy is the desirable therapeutic procedure, except in young subjects in whom the hypertrophy is manifestly muscular. According to reports 7 males and 3 females suffered from the muscular type of hypertrophy of the pylorus, and 65 men and 16 women suffered from the sclerotic type. The latter type reaches its maximum frequently between the ages of thirty and sixty years.

MARSH W POOLE, M D

Perman, E : The Operative Treatment of Pylorospasm (Die operative Behandlung von Pylorospasmen) *Nord med Tidsskr*, 1937, p 201

Ramstedt's operation for pylorospasm has a mortality of 8.5 per cent as shown by statistics on 1,609 cases which were operated upon in 1934 in 24 clinics. Kirschner's operation and also von Haberer's operation are recommended. With the former there were 4 deaths in 83 operations, and with the latter there were 7 deaths in 102 operations. The unfavorable experiences occurred mostly in the earlier years. Later the mortality figures were reduced on the average from 2 to 5 per cent.

In the period from 1932 to 1936 the author operated upon 14 additional patients whose ages varied between nineteen and seventy-six days, 1 child was six months old. One death was due to uncontrollable vomiting in spite of relaparotomy with radical division of the muscle fibers. The operations themselves were performed as directed by Ramstedt (*Ergebn. d. Chir*, 1934). He recommends myotomy of the pyloric musculature under local anesthesia of the abdominal wall. The author favored the incision in the sheath of the right rectus muscle instead of the midline incisions of Ramstedt and Kirschner. The not uncommon complication of bleeding was avoided by the author by coagulation of the small bleeding vessels with a fine diathermy electrode. In general the operative results were very excellent. As early as two hours after operation some fluid could be given.

Moderate vomiting in the first days after operation is no cause for alarm. The dietetic management is best left in the hands of the pediatrician. Operation should not be postponed too long because of the rapid decline in the general condition of the infant. Conservative treatment should be continued not longer than one week.

(GERLACH) JACOB E. KLEIN, M D

and massive collapse with resulting traumatization involving the diseased lung.

If an adhesion is sufficiently long to permit complete collapse, the cavity may diminish in size or close up but the quality of the aeration is questionable. Local recurrences have been reported by many who discontinued a pneumothorax which proved efficient for many years. Scorpini has published reports on several cases illustrating the unfavorable effect of adhesions upon tuberculous foci. Specimens are described showing the inspiratory traumatism directly transmitted to the foci and the injurious effect even when collapse appeared adequate and there was no radiological evidence of traction by the adhesion. Such irritated foci may be the cause of dissemination of infection to other parts of the lung or lead to resurrection of old lesions *in situ* after pneumothorax has been discontinued. Scorpini has proved that adhesions may have an unfavorable effect also upon lesions at some distance. Micheli reports three cases in detail and from his clinical and pleuroscopic findings draws the following conclusions:

1. Resection is indicated not only when the adhesions manifestly hinder the efficacy of the pneumothorax but whenever they are so situated as to have an unfavorable effect upon the tuberculous foci.

2. Intervention should be early. It is useless and even dangerous to wait months before operating.

To determine the optimum time for intervention not only clinical and roentgenological pulmonary findings are of aid but also a thorascopic study of the pleura.

LEON SCORPINI, MOORE

ESOPHAGUS AND MEDIASTINUM

Erzel E. Dilatation of the Esophagus Compared with Lesions of Auerbach's Plexus in Megalo Esophagus (La dilatación del esófago frente a las lesiones del plexo de Auerbach en el megaloesófago). *Del 4^{to} trab. Soc. de Ciruj. de Buenos Aires* 1937 25 131.

Erzel reviews the theories of the pathogenesis of megalo esophagus and reports two cases with autopsy and one animal experiment. In the first case that of a man of twenty eight years there was a concomitance of megacolon and severe esophagitis with

great hypertrophy of the circular muscle and acute degeneration of Auerbach's plexus. The diameter of the esophagus was normal and symptoms of achalasia of the cardia were absent. The duration of the symptoms of megacolon was three and one half years and a partial colectomy of the sigmoid had given only temporary relief. In the second case, that of a man forty two years old who died of heart failure symptoms of megalo esophagus and megacolon had been present for five years. The esophagus was extremely dilated but its layers were normal except for vestiges of a previous chronic inflammation. Auerbach's plexus was totally destroyed and only scars at the nodal points were left.

In the single successful experiment on a dog a ligature was passed around the cardia which allowed the passage only of sufficient food to maintain life. At the end of five months the esophagus was enormously dilated and its musculature moderately hypertrophied. Its structure including Auerbach's plexus was normal.

The vagi were normal in all three instances.

The deduction from these observations is that the lesions of Auerbach's plexus in megalo esophagus are not caused by dilatation of the organ. The reported cases of achalasia of the cardia in the stage of compensation with hypertrophy of the esophagus and typical lesions in the plexus but without dilatation do not necessarily prove that destruction of the plexus is the only cause of megalo esophagus. Apparently there is a relation between the degree of dilatation and the extent of the nerve lesions although experimentally at least a great dilatation can exist with a normal plexus. Only further experiments can establish definitely the actual relationship between megalo esophagus and lesions of the plexus and also prove whether esophagitis precedes the nerve lesions or whether the inflammation of the organ is secondary to the trophic changes which are undoubtedly caused by destruction of the plexus. These observations illustrate three aspects of the problem: a lesion of the plexus without dilatation of the esophagus; total destruction of the plexus with enormous dilatation; and a normal plexus with a much dilated esophagus.

The article is accompanied by references and microphotograph.

M. E. MOORE, M.D.

Strangulation of the bowel modifies the prognosis more than any other single factor as far as surgery is concerned. Under warm packs, the bowel should be watched for fifteen to twenty minutes for signs of viability, viz., return of color and glistening, return of pulsation in the vessels, and return of peristalsis on stimulation. If the loop does not show these changes, it is usually safer to resect it. If the bowel appears able to survive, it should be returned intact. However, in a certain proportion of cases there is danger that an area of necrosis will develop with consequent leakage. The strangulation obstruction cases do not suffer so much from salt loss as from loss of plasma volume. Consequently, blood transfusion is indicated instead of too much salt, which may be harmful. Blood chemistry studies during the early pre-operative and postoperative stage are very important.

There are certain surgical principles which should be applied to any case of small-bowel obstruction. The surgeon should operate only under circumstances as favorable as they can be made. Nothing more should be done than is absolutely essential to restore the bowel to its normal relationship. The removal of an appendix or a Meckel's diverticulum is usually unnecessary and subjects the patient to an added risk. The simplest procedure which will relieve the situation is the best. Gentleness in manipulation of the bowel will diminish the postoperative discomfort. If the surgeon will trace the collapsed loops upward from the ileocecal region to the distended intestines, he will do less damage to his patient. Gangrenous patches can be turned in locally without a more elaborate procedure. Massive gangrene of a loop forces the hand of the surgeon and makes him perform more extensive procedures than he would choose under the circumstances. Sometimes a side-tracking operation will be the most simple solution of a complicated situation. Care should be taken to minimize trauma and to cover raw areas so that future obstructions may be prevented. At times in chronic recurring obstructions, it will be necessary for the surgeon to use all his ingenuity and versatility to solve the problem. When obstruction has occurred repeatedly about the same area of the intestine, it is sometimes best to perform a radical resection of this region. The tendency toward repeated obstruction is usually based upon a pathological process. Removal of the diseased tissue is the best insurance against future obstructions. Spinal anesthesia makes the surgery much easier from a technical standpoint. The inhalation anesthetics are to be avoided whenever it is possible without sacrifice.

The article includes six case reports which illustrate the undesirability of unnecessary and meddling surgery, the dangers of returning a loop of bowel in which the viability is somewhat questionable, and the failure of enterostomy in paralytic ileus. The author believes that suction drainage in a paralyzed bowel is as efficient as enterostomy, without the complications of the latter.

JOHN E. KIRKPATRICK, M.D.

Hoelzel, F., and Da Costa, E.: The Production of Peptic Ulcers in Rats and Mice by Diet Deficient in Protein. *Am J Digest Dis & Nutrition*, 1937, 4: 325

Previous study has shown that ulceration will occur in the pro-stomach of some rats after starvation every other day for seventeen days. More striking ulceration can be produced when rats starved in this manner are injected with histamine on the starvation days.

Hoelzel found that when he fasted for protracted periods gastric acidity could be increased by protein dietary restriction, and that a peculiar and intensive hunger sensation developed which he recorded as a "protein hunger sensation." "Fasting gastric acidity decreased and the protein hunger sensation disappeared with protein realimentation." From these observations it was believed possible that ulcers might develop in rats secondary to sufficiently prolonged starvation or protein restriction alone, and 'ulceration thus produced could eventually be regarded as objective evidence of protein hunger carried to a pathological extreme."

In a previously reported experimental study, 35 rats were starved every other day or during alternate two-day periods and some of the rats were fed a diet adequate in protein and others a diet low in protein. Some of these rats developed ulcers in the pro-stomach even though the diet was adequate in protein, but all the rats receiving a diet of approximately 3 per cent protein for more than two weeks developed pro-stomach ulcers.

From these observations the study was extended to determine the effect of more prolonged starvation, protein restriction without starvation, diets high in protein, diets differing in the main type of protein used, high and low carbohydrate and fat diets; watery diets, diets deficient only in Vitamins A and B, and diets to which salt, pepper, mustard, acetic acid, alcohol, hydrochloric acid, or antacid were added.

Prolonged starvation with adequate water proved to be the most effective method of producing ulcers in the pro-stomach of rats. Ten rats fed a diet with 6 per cent powdered yeast as a sole source of protein had ulcers in the pro-stomach when sacrificed after from thirteen to twenty-one days. Five of 12 rats had pro-stomach ulcers after having been fed for fourteen days on a diet containing 20 per cent gelatine as a chief source of protein. Nineteen of 27 rats fed only with white bread which contained 10 per cent protein showed ulceration in the pro-stomach at the end of four weeks. Diets low in protein caused ulceration even though they were high in carbohydrates or fat. Wet low-protein diets caused little or no ulceration. Hydrochloric acid and soda bicarbonate led to a reduction in food intake. The acid produced more acute erosions and ulceration, whereas the alkalis led to some hyperkeratinization about the ulcers which developed in the pro-stomach.

Most of the ulcers produced by starvation or protein restriction healed completely when diets ade-

Tinozzi F P *Pneumatosis Cystoides Intestinalis*
(Sulla pneumatosis cistica dell'intestino) *Ann Ital*
di chir 1937 16 295

The author reports a case of pneumatosis cystoides intestinalis arising from the cecum. The symptoms were those of an acute appendicitis and at operation a mildly inflamed appendix together with an irregularly shaped tumor mass were encountered at the cecum. The tumor mass seemed to originate from the wall of the intestine at the base of the appendix measured from 6 to 7 cm in diameter and contained numerous irregular cystic masses from which only gas could be aspirated. The operative procedure consisted of resection of the neoplasm and appendectomy.

Histological preparation of the appendix revealed a mild inflammatory reaction also that the new growth consisted of numerous irregular sized and shaped clear vesicles surrounded by a thin endothelial layer similar to that of lymph vessels serosa and a connective tissue subserous layer.

The etiology is obscure. The genesis of the gas has been variously ascribed to a chemical or enzyme action, infections from gas producing organisms or as associated with lesions of the gastro intestinal tract which destroy the mucosa and allow the escape of gas into the submucous tissue.

GEORGE C. FINOLA M.D.

Morton J J *Factors Determining the Selection of Operation in Obstruction of the Small Intestine* *Surgery* 1937 2 848

The factors influencing a surgeon's judgment in the treatment of intestinal obstruction which must be given serious consideration are the general condition of the patient, the time since the onset of the obstruction, the cause, the level at which it occurs, the local condition of the obstructed bowel and the changes in the chemistry of the blood. The patient's condition when first seen is essentially the resultant of all these factors.

It becomes a prime necessity to estimate how sick the patient really is when first seen. There will be little difficulty in recognizing very late toxicosis or the very early obstruction. It is in the patient who has passed the first forty eight hours after the onset of the obstruction that it is difficult to make a prognosis. The patient is restless and worried and has a worried expression. The tongue is red and dry. The vomitus has a fecal odor. The small bowel usually has distended quite considerably. Visible peristalsis and borborygmi are present. Leucocytosis is high out of proportion to the abdominal signs. The non protein nitrogen is high. There is no way to determine strangulation of the bowel except by surgical exploration and if the diagnosis of complete intestinal obstruction is made at the onset of the symptoms the sooner surgery is undertaken the better.

There is really no safe period for observation of a patient without the risk of gangrene of the bowel. Gangrene of the bowel may develop in from three to ten hours after the circulation has been shut off.

This uncertainty is a very definite reason not to attempt reduction of an obstructed hernia by taxis.

Since it is usually the surgeon's lot to deal with late obstruction, he should take time to improve the patient's condition by decompression with Wangensteen suction drainage, by making up deficiencies in the blood chemistry by the use of blood and fluids with salt and dextrose and by giving the patient morphine for rest and the improvement of the tone of the bowel.

When the cause of the obstruction is obvious the prognosis is usually good. For this reason obstructed hernias are recognized quickly and operation is done in the favorable period. Therefore the prognosis for intussusception in children is good also unless there is doubt about the diagnosis. It is also fairly common to get a reasonably early diagnosis in patients who have obstructions about old adhesions from previous abdominal operations. When the diagnosis is obscure delay is frequently responsible for a poor prognosis. In consequence the obstructions due to mesenteric thrombosis, intussusception in adults, volvulus about a Meckel's diverticulum, obstructions of loops through tears in the mesentery and internal herniations often have a poor prognosis. Strangely enough the obstructions which follow recent surgical interventions are rarely found early by the surgeons in attendance. The something is the first week or ten days after operation is assumed to be natural for certain patients. The crampy pains are believed to be gas pains only. It is hard for the surgeon to realize that such a calamity can follow one of his operations. The diagnosis is therefore made with reluctance. On the other hand obstructions in the presence of peritonitis are expected. If a patient with peritonitis passes the two weeks period without obstruction it is considered fortunate. Both of the latter type of obstructions offer a fairly favorable prognosis however for frequently it is possible to carry them on suction drainage until the adhesions are absorbed. The high obstructions about the mesentery in infants are usually partial they constitute a class in themselves requiring special handling. Obstructions occurring in pneumococci streptococci or tuberculous peritonitis are conditioned by the severity of the general infection. Generally it is thought that high obstructions are more dangerous than low ones. From experimental work it has been concluded that the nearer the obstruction to the bile ducts the more severe is its character. It is our experience that this is not true unless a short high loop is strangulated. The high obstructions are more easily controlled by suction drainage than the low ones. The salt and water balance constitutes the main difficulty in the high obstructions. This can be restored quite readily after which restoration the toxicity as measured by non protein nitrogen approaches normal. The low obstructions sometimes also respond well but there is more opportunity for some of the loops to twist and become trapped. The plasma volume must be taken into consideration under such circumstances.



Fig. 2.

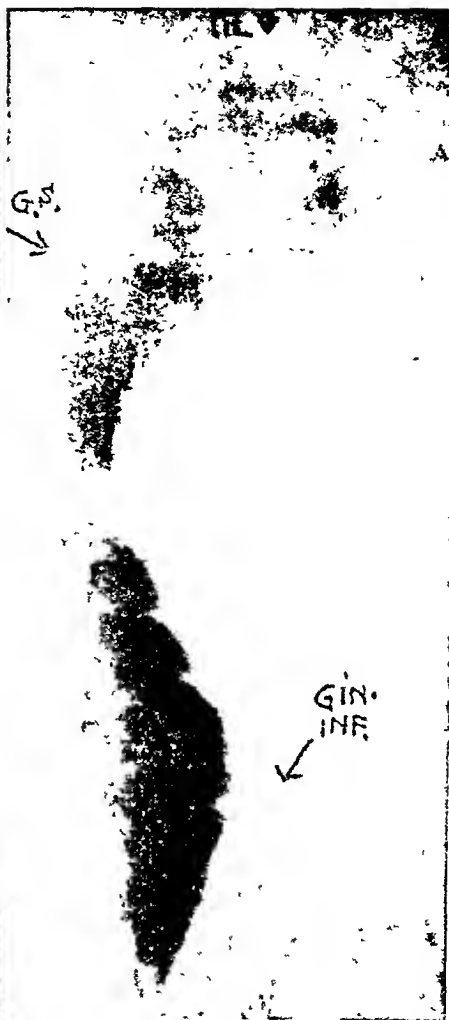


Fig. 2a

Fig. 2 Ulcerated vegetative tumor of the second portion of the duodenum Fig. 2a The same after x-ray therapy G.S. is the superior flexure Gin. inf. the inferior flexure Supraclavicular metastases Temporary improvement. Death after seven months

and this probability increases the nearer the stenosis is located to the third segment. It is difficult, however, to determine the nature of the stenosis when an ulcerative process has caused permanent and extensive lesions. The diffuse stenosis of severe periduodenitis is a frequent source of error. In the presence of an elongated and rigid stenosis without folds and without signs of ulcer, it can only be said that the stenosis is organic and a tumor may be suspected without excluding ulcer. Plaque-shaped filling defects or localized dilatations with rigid walls and loss of mucosal pattern suggest sarcoma or carcinoma with deep ulceration.

An extensive stenosis reducing the lumen to a rigid tube with multiple hoses is more characteristic of sarcoma the nearer it is located to the duodeno-jejunal angle.

A filling defect of the vegetative type indicates a duodenal tumor, either primary or secondary. If the defect is sessile or pedunculated, not extensive, and its outlines regularly circular, the tumor is probably benign. A villous aspect shows that it is a carcinoma.

Infiltration due to extraduodenal malignant or tuberculous glands is often indistinguishable from that due to a primary duodenal tumor. When there

quate in protein were given. The healing response to a single meal of adequate food after a prolonged fast was striking. The ulceration thus produced was regarded as objective evidence for the theory postulated by the authors that ulcers in the pro stomach of rats may be secondary to protein hunger or amino acid hunger caused to a pathological extreme.

SAMUEL J. FOWLERSON, M.D.

Bonomini, R. A Contribution to the Radiological Study of Tumors of the Duodenum (Contributo allo studio radiologico dei tumori del duodeno). *Radiol med* 1937 34 627

In connection with fifteen cases, Bonomini discusses the radiological pictures of the chief forms of primary and secondary tumors in each segment, their differential diagnosis and the extrinsic or intrinsic conditions which may simulate tumor.

Tumors of the bulbous portion are particularly favorable for diagnosis. The author has never seen bulbous tumors presenting unilateral filling defects. Among the rarer causes of an extrinsic filling defect are the rosette formation of a contracted pylorus after inflation, idiopathic pyloric hypertrophy in the adult, edema or varices of the bulbous mucosa and herniation of hypertrophic portions of the antral mucosa. In both the first and second portions great difficulty arises in differentiating between tumor and ulcer. Hypertrophic bulbous duodenitis may give filling defects which except for their variability in form imitate tumors perfectly. All dogmatic statements as to pathognomonic signs of bulbous tumor are oversimplified. A filling defect in the bulb indicates tumor only after accurate exclusion of other causes.

An annular pancreas is among the rare extrinsic conditions which may simulate tumor in the second portion. Much care is necessary in the interpretation of findings in the peripapillary region.

While in the first and second portions the causes of stenosis are principally organic, in the third portion mechanical stenoses due to position and characteristic of this segment appear. The latter are caused by compression by the mesenteric pedicle or prolapsed right kidney and closure of the duodenojejunal angle. Differentiation between extrinsic organic stenosis and spastic stenosis of the third portion is difficult.

The general conclusion of this study is that only a probable diagnosis of duodenal tumor is possible and that only in particular cases. The chief merit of radiology in these cases is that it allows at least a probable early diagnosis of a stenosing tumor in patients presenting mild digestive disturbances. An important finding is a small indistinctly outlined filling defect when foreign bodies and retroduodenal glands are excluded, which suggests a benign tumor if it is in the first or third portion and a malignant tumor if peripapillary. This judgment should be confirmed by the appearance of the mucosal folds.

A sharply outlined annular stenosis of short extension with the characteristics of a filling defect is more likely to be a carcinoma than a cicatricial process.



Fig. 1. A duodenal tumor with central filling defect is simulated by herniation of a pedunculated polypoid tumor of gastric origin.



Fig. 2. The stomach shows a large filling defect on the lesser curvature which is prolonged through the pylorus into the enormously dilated bulb. At operation a cauliflower vegetation from the original adenocarcinoma measuring 8 by 3 cm. was found protruding through the pylorus.

calls attention to the fact that his primarily closed and non-irradiated cases showed the same favorable postoperative course that was noted in the irradiated cases. Complications could not be avoided by the preceding irradiation, as Henschen emphasized in contrast to Havlicek. Therefore, it seems to the author that the good results of Havlicek should be attributed mostly to the closed treatment of the abdominal wall. The author believes that the fact that primary closure of the abdominal wall is used in the greatest number of cases denotes a valuable advance. Regarding irradiation, a decline of the original enthusiasm has become noticeable. The author can show no successful results from the treatment of severe cases with peritonitis serum.

(MAXIMILIAN HIRSCH) LOUIS NEUWELT, M D

LIVER, GALL BLADDER, PANCREAS, AND SPLEEN

Boyce, F. F., and McFetridge, E. M.: Autolysis of Tissue *in Vivo*: An Experimental Study with Its Clinical Application in the Problem of Trauma to the Liver. *Arch Surg*, 1937, 34 977

In any consideration of autolysis of tissue *in vivo* previous discussions have centered around the part played by the gas bacillus and the findings have been regarded as entirely experimental. The authors believe that the problem has a clinical aspect with regard to the so-called "liver death," and that the rôle of the gas bacillus is entirely secondary.

Jackson, in 1909, working on tissue autolysis demonstrated the depression of the freezing point of such tissue when an unknown organism was present. This organism was never present in six hours, but was uniformly present in twelve hours in liver tissue aseptically removed, ground, and incubated. This organism, later called bacillus welchii, was thought by earlier investigators to be the cause of tissue autolysis.

Since 1925 the problem of liver autolysis has been attacked by many. The authors review these works and report on their own experiments.

Aseptic implantation of whole and ground liver into the peritoneal cavity of dogs by several investigators produced death in from eight to sixteen hours, and each dog presented characteristic post-mortem changes of autolytic peritonitis. The authors confirmed this work.

Implantation of a preheated liver, by other workers and the authors, produced death in from forty to forty-five hours with the resulting usual post-mortem changes.

Most investigators found either delay or no lethal effect from implanting the autoclaved liver. In the authors' work with the autoclaved liver, implantation produced only one death, the other animals lived.

The use of ground incubated liver, however, produced autolytic peritonitis with death in nine hours. The use of ground incubated liver autoclaved before implantation deferred death for thirty-six hours.

Implantation of various sections of the liver by others produced varied results. The authors produced death in eighteen hours from autolytic peritonitis whether central or peripheral portions of the liver were used and if the bacillus welchii was recovered.

The authors found that the implantation of tissue other than liver tissue, such as that taken from the pancreas, kidney, lungs, and heart, produced death. One dog in which only heart muscle was implanted, survived.

The authors believe that intraperitoneal and intravenous injections of various liver extracts is unreliable because of the variation of the preparation and concentration of the extracts.

Intraperitoneal and intravenous injections of the peritoneal exudate of dogs dying from autolytic peritonitis produced negative results in all of the investigations, including the authors'.

The use of various culture mediums produced no ill effects, but bacterial suspensions, especially the aerobic suspensions, produced death, however, the picture was not that of autolytic peritonitis.

The implantation of fetal liver by other workers was negative. The authors were able to produce death from autolytic peritonitis only by implanting large amounts of fetal liver.

In the following experiments, which were done only by the authors, typical post-mortem changes were produced in five of six dogs with the use of variously ground, unground, autoclaved, and unautoclaved liver combined with the use of tetanus antitoxin. The sixth dog, after having had unground autoclaved liver implanted and receiving tetanus antitoxin, survived.

In commenting on the experiments the authors mention that all of their work was done on dogs and that their sterile technique was as flawless as possible. Further, their autopsies were performed immediately after death, as any delay would give altered findings in the host's liver. Many investigators found these changes but did not explain them.

As to an explanation of what happens in these experiments there are two schools of thought. One believes the important consideration is the growth of bacteria in the autolyzing liver or other tissue. The other, to which the authors agree, believes death is due to the absorption of toxic products generated from the liver tissue deprived of its circulation. The authors conclude that while autolysis may occur under any circumstances with the implantation of liver, the latent period is prolonged by the use of autoclaved liver and shortened or eliminated by the use of incubated liver. Death occurred sooner when ground liver was used because the rate of autolysis and the absorption of toxins is faster because of the larger surface area. There is also a definite relationship between the size of the dog and the amount of liver implanted, larger doses cause death more quickly, as shown by experiments with fetal liver.

The authors believe that the rôle of the gas bacillus in autolytic peritonitis is entirely secondary, and

are signs of a tumor in the vicinity, diffuse rigidity of the walls without stenosis is evidence of secondary infiltration

The article is accompanied by roentgenograms and a bibliography M E. MORSE MD

Pemberton J and McCormack C J. Submucous Lipomas of the Colon and Rectum. *Am J Surg* 1937, 37 205

A review of the literature revealed 113 cases of submucous lipoma of the colon and rectum. In 94 of these cases the tumor produced symptoms. Three cases in which the condition was treated successfully by operation have been added. Submucous lipomas of the colon and rectum affect chiefly women who are between forty and sixty years of age. The tumors are found in the cecum, ascending colon and sigmoid flexure in the order named. The condition is rarely diagnosed pre-operatively. The most common diagnosis is carcinoma and acute appendicitis. The symptoms are those of intestinal obstruction and the average duration of symptoms is forty-one and five tenths months. The treatment is surgical removal in one stage if possible or by means of graded procedures.

Vilardo S. The Dissociated Phase of *Shigella* Coli and Histopathological Lesions in Appendicitis (Case dissociativa del *B. coli* e lesioni anatomiche nelle appendiciti). *Chir. chir* 1937 13 363

Since there are apparently no published reports of the relationships between the type of infective lesions in an organ and the phase of the bacteria producing them, Vilardo studied 5 cases of appendicitis from this standpoint. The material was obtained from the lumen and by stroking the walls of the appendix and aerobic cultures were made on plain agar. The bacteria isolated from selected colonies of each type were studied by the usual methods and also for agglutination with tripaflavine and for pathogenicity by intraperitoneal inoculation of guinea pigs. In 20 cases (80 per cent) only colon bacilli developed, in 3 (12 per cent) bacteria which were not definitely identified, and in 2 (8 per cent) there was no growth. Only the bacillus coli colonies were studied and the smooth type always predominated; the rough and medium forms were rare.

The histological findings in the appendices from which only smooth colonies developed consisted essentially of acute or subacute inflammation with hemorrhagic foci, leucocytic infiltration and frequent abscess formation. The development of connective tissue was slight. In the appendices from which rough and intermediate colonies also developed, the basic characteristic of the lesions was a focal or diffuse hyperplasia of the subserous intramuscular or subserous connective tissue which in some instances was so great as to disrupt or replace entirely the muscular coat.

The protocols are given in full with tables and a bibliography M E. MORSE MD

Muellereder A. Appendicitis and Primary Closure of the Abdominal Wall (Appendicitis und primärer Bauch Jeckenschluss). *Wien med Wchenschr* 1937 1 67 98

The author calls attention to the fact that an improvement in the results of treatment of appendicitis may be achieved by primary closure of the operative wound without drainage. To this primary closure of the abdominal wall first proposed by Clairmont Havlicek has recently added irradiation with the Laparophos lamp. The question, therefore arises: (1) whether the primary closure of the abdominal wall in itself is sufficient to improve the results; (2) whether the improvement is to be attributed to the irradiation alone; or (3) whether it is the combination of the primary closure with the preceding irradiation that is responsible for the improvement in the results.

From his material the author shows unquestionably that more fatalities occurred in the cases in which drainage was done than in those in which it was not done. He was able to reduce the mortality from 32 to 0.83 per cent. If intraperitoneal abscesses develop after operations without drainage, e.g., a Douglas abscess, they must be incised in time; furthermore, the author has learned by experience that the abscess formation cannot always be avoided by the insertion of a drainage tube into the cul de sac of Douglas. However, under certain definite indications, e.g., in children under ten years of age and also in patients over fifty years of age, the author uses drainage also when the intestinal coils are covered with much deposit and are agglutinated, when foul smelling exudate is present in large amounts and when the pus from the Douglas pouch from the region of the liver from the gastric gutter and from the left side flows toward the incisional wound; drainage is indicated.

It is important to restore the intestinal activity as soon as possible for this purpose the author uses hot air, the thermophore, and small injections of from 10 to 20 ccm of water with a few drops of glycerine into the rectum; he also gives neohormonal intramuscularly or if necessary intravenously; he has also had good results with prostigmin. The author also attaches great importance to the upright sitting posture of the patient in bed and excellent results have often been obtained with the intravenous continuous drop infusion of glucose solution.

According to the author's experience of fifteen years, primary closure of the abdominal wall is well suited to make the disease picture milder, as well as to shorten the duration of healing. The post-operative course is very light and the temperature usually falls by lysis, except in the cases with abscess formation. The patients almost never complain of special pains and they look fresh. This method also has the advantage that incisional hernias almost never occur.

In regard to the question of the effectiveness of irradiation with the Laparophos lamp, the author

GYNECOLOGY

ADNEXAL AND PERIUTERINE CONDITIONS

Darmaillacq, R., and Ferran, C.: Twelve Cases of Rupture of a Pyosalpinx into the Peritoneal Cavity (Rupture de pyosalpinx en p ritoine libre,   propos de 12 observations) *Bordeaux chir*, 1937, 5 181

The authors make a distinction between a large pyosalpinx distended with pus which breaks mechanically from rupture of its wall, and a perforating pyosalpinx analogous to perforating appendix from a very virulent infection which has caused necrosis of the wall at one point. In the latter case the tube may not be greatly increased in size. In the presence of acute virulent infections there are few adhesions around the diseased tube and the peritoneum has not been "vaccinated" by previous attacks of pelvi-peritonitis. The authors do not include the cases in which there is pus in the abdomen coming from the opening of the tube without perforation.

Huet and the authors think that the latter are less serious than true ruptures, but the authors recently observed a fatal outcome in a case in which generalized gonorrheal peritonitis without perforation had caused paralytic occlusion of the intestine.

While there is general agreement that operation is necessary in ruptured pyosalpinx, agreement is not so general as to the degree of operation to be performed. Four types of operation may be used: laparotomy and simple drainage with a Mikulicz drain, removal of only the diseased tube or a bilateral salpingectomy, subtotal hysterectomy, and total hysterectomy.

The authors performed Mikulicz drainage in 5 cases with 2 deaths, subtotal hysterectomy in 4 cases with 1 death, total hysterectomy in 2 cases with 1 death, and 1 unilateral salpingectomy with recovery. Two of the patients treated with Mikulicz drainage were in *extremis* when operated on. Total hysterectomy was done late on the patient who died, the other patient was operated on within thirty-six hours and bore the operation well. The four subtotal hysterectomies were done quite early. The patient who died was an obese syphilitic with aortitis.

From their experience the authors conclude that early diagnosis and operation are very essential. As a general rule they prefer subtotal hysterectomy with drainage by slitting the posterior lip of the cervix and the use of a Mikulicz drain. The simple Mikulicz drain should be used in cases in which the patient's condition is serious or local conditions render operation difficult. In these cases it acts as a partition to close off the pelvis rather than as a drain. Its application should always be preceded by as complete an aspiration of the pus as possible. Of course, in cases of small perforations with few or no adhesions and without other lesions of the uterus and adnexa, removal of the diseased tube alone, followed by abdominal drainage, is sufficient.

The prognosis of rupture of pyosalpinx is serious; early operation is the best way of reducing the mortality, but even with early operation there are failures due to differences in the virulence of the bacteria. Cases that perforate in the course of very septic pelvi-peritonitis are much more serious than cases of old pyosalpinx that contain an almost sterile pus. Microscopic examination followed by culture when possible gives valuable information in regard to prognosis.

AUDREY GOSS MORGAN, M.D.

EXTERNAL GENITALIA

Aman-Jean, F.: The Treatment of Cancer of the Vulva (Discussion des traitements des cancers de la vulve) *Bull et m m Soc d chirurgiens de Par.*, 1937, 29 232

The results of treatment of cancer of the vulva have been rather poor, recoveries have not been obtained in more than 25 per cent of the cases. The author proposes a method in which he first irradiates the vulvar tumor with radium by the method of puncture with radium needles. He uses rather small doses, from 133 to 2 mgm, and arranges the needles so that the irradiation will be uniform. The bone, the meatus of the urethra, and the labium majus of the normal side must be protected. After the tumor has disappeared and the radium reaction passed off the regional glands are removed by surgery. These glands cannot be irradiated because of the danger of abscesses and dissemination of cancer cells.

The surgical operation is very extensive, including a perineal stage, an inguinocrural stage, and an inferior abdominal stage. A thorough ablation of all tributary glands must be performed. The bleeding surface is very large and the task of suture appears somewhat formidable, but it proves simple, just as in cancer of the breast in which there is also a large bleeding surface.

The author has used this method in three cases. Operative shock was slight and recovery uneventful; the drains were removed on the fourth day, the sutures on the tenth, and the patients were up at the end of two weeks. A small bleeding surface the size of a franc persisted in front of the meatus of the urethra for a long time but finally closed. The results were not esthetic, but they were effective and very much better than those obtained in 40 other cases by various methods. The author intends to use this method in the future and to publish a comparison of the results in the 40 old cases with those of the new method. One of the patients was operated on a year and a half ago and has had no recurrence.

In the discussion MASSART said that while this operation was long and laborious it did not cause much shock. No important organs were involved and it did not differ from the ordinary operation for cancer except in the size of the wound.

that the autolysis of the tissue produces the fatal results. The anaerobic organism was always present in the cultured peritoneal fluid regardless of whether the liver was autoclaved or not. Yet, the injection of this fluid intravenously or intraperitoneally did not reproduce the picture of autolytic peritonitis. In the authors' own experiments the use of tetanus antitoxin did not stave off the fatal outcome in autolytic peritonitis. The presence of the gas bacillus in tissue autolysis is important only in that it hastens the process of autolysis by acting as a catalyst. The absence of the bacteria, as in the use of autoclaved liver, prolongs the latent period sometimes to such a degree that the animal is able to survive. Incubation of the liver has the reverse effect.

Clinically, such pathological conditions as intestinal obstruction, acute appendicitis and trauma present most uneven results following the use of gas bacillus antitoxin. The authors wonder whether it is not a question of autolysis of tissue disconnected from its supply of blood with the toxemia which results therefrom.

The authors have reviewed fifty-four cases of injury to the liver only. Stab wounds of the liver are the least fatal, while ruptured wounds are the most dangerous. The diagnosis of injury to the liver was confirmed in forty-three patients who were operated upon and of whom nineteen died. Among these nineteen deaths there were seven cases of liver death. In eight cases of rupture of the liver immediate exploration was done and in seven typical degenerative changes in the liver and kidney were found at autopsy.

The authors believe our outlook on injuries to the liver must be changed because of the importance of

hepatic necrosis. Exploration should be undertaken in every case in which injury to the liver is suspected and in which the patient is not actually moribund. Abrasions of the liver are better untouched. Lacerations should be sutured, not packed. In extensive wounds in which there is extensive necrosis of hepatic tissue, the authors believe resection is the best treatment.

HARVEY S. ALLEN, M.D.

Levy S. E. and Blalock A. The Effects of Obstruction of the Common Bile Duct on the Portal Blood Flow and Oxygen Consumption. *Surgery* 1937: 1: 33.

By means of temporarily obstructing the inferior vena cava above and below the entrance of the hepatic veins and diverting the blood during this short period into a cannula which has been passed into the inferior vena cava through the external jugular vein, the rate of blood flow was determined on unanesthetized dogs before and from nine to twenty-six days following complete division of the common bile duct. By means of samples removed from the cannula, the oxygen consumption by the liver could be determined at the same time.

All of the animals studied became markedly jaundiced and had elevated icteric indexes. They all lost weight and a few became moderately anemic but none had any hemorrhagic manifestations.

In 6 dogs the portal blood flow increased on an average of 27.3 per cent; in 2 the flow decreased 12.8 per cent after common-duct obstruction. Four dogs showed an increase of oxygen consumption while one showed no change and one showed a decrease following common-duct obstruction.

THOMAS C. DOUGLASS, M.D.

ocrine glands, not only the ovarian function but that of the thyroid and pituitary glands, by producing a vagosympathetic imbalance, by inhibiting or exciting the activity not only of the genital organs, but also of the other organs, such as the gastrointestinal tract and the heart

Either amenorrhea, persisting for a shorter or longer period, or oligomenorrhea, or menorrhagia or metrorrhagia may follow trauma to the genital regions. Such amenorrhea or oligomenorrhea is often associated with lumbar and abdominal pain, leucorrhea, and such symptoms as headache, hot flashes, increase in the size of the thyroid gland, tachycardia, and insomnia. In some cases without definite menstrual disturbances the chief post-traumatic symptoms are pain, sensations of pain and "burning" in the external genitals and abdominal pain, either generalized or localized. Such symptoms sometimes result in mental disturbances.

The authors note that in industrial injuries, it is not necessary, according to the French law, to consider whether there was any condition present predisposing to the development of the symptoms produced by trauma. If it can be proved that the trauma occurred and that it was responsible for the development of the symptoms that partially or wholly incapacitated the worker, she is entitled to compensation. In other types of injury, in which a medico-legal question arises, the question of whether there was a pre-existing or predisposing condition that was a factor in producing the post-traumatic symptoms is of more importance. ALICE M. MEYERS

Rossi, D : Ureteral Lesions During Gynecological Interventions (Lesioni ureterali nel corso d'interventi ginecologici) *Arch. di ostet. e ginec.*, 1937, 15: 256

The author reports a case of transverse section of the ureter during an intervention for an extensive chronic pelvic disease, and then discusses the various lesions that occur to the ureters in gynecological surgery.

From a thorough review of the literature he classifies these lesions anatomically into transverse section, longitudinal section, constriction by ligature, transfixation by suture, and destruction secondary to altered nutrition caused by compression or infection.

The treatment consists of immediate suture, transplantation of the ureter into the bladder, transplantation into the intestine, releasing of the ligature, or primary and secondary removal of the kidney.

In the author's case the severed ureter was discovered during operation, and with sufficient mobilization transplantation into the bladder was accomplished. The patient's postoperative course was uneventful until the sixth day when removal of the stitches released a serosanguineous fluid with the characteristic odor of urine. The fistula continued to drain for from fifty to sixty days, then it gradually stopped. Repeated cystoscopies, intravenous dyes, and x-ray photographs later proved the corresponding kidney to have undergone a functional atrophy or auto-occlusion. GEORGE C. FINOLA, M.D.

LAVOS said that it was hard to judge of the efficacy of this method from three cases and that certainly the operation was not simple. The removal of such large skin areas, particularly the evacuation of Bogros space after section of Gubernat's ligament did not seem to him to be free from danger. Injury of a vessel might necessitate complicated procedures. The fatty cellular tissue of this region is not resistant to infection, he doubts whether it is prudent to pursue the lymphatics and glands beyond the inguinal group. If further cases show the value of the method he will be glad to acknowledge his error.

ALFRED GOSSE MORGAN M.D.

MISCELLANEOUS

Robecchi E. Contributions to Small Dose Ovarian Roentgenotherapy in Menstrual Dysfunction (Contributo alla Roententerapia ovarica a piccole dosi nelle turbe mestruali in disfeito). *Ginecologia Torino* 1937 3 345

The author submits his clinical investigations on small dosage roentgenotherapy to the ovaries of eighteen patients with amenorrhea or irregularly delayed and scattered menstruation.

Of the eighteen patients five had a primary amenorrhea at puberty, three continued to have irregularly delayed and scattered menstruation dating back to puberty, five had a secondary amenorrhea, of regular onset followed in several years by cessation, and five had irregularly delayed and scattered menstruation following a regular rhythm at puberty.

The total roentgenotherapy for each patient varied from 30 to 130 r and the treatments were repeated in several cases only after a lapse of six months.

The results in the four groups above showed that the roentgenotherapy successfully established menstruation to three of the five patients in the first group, in all three of the second group, although in one case the menstruation was only temporary, in two of the third group and in three of the fourth group. There were seven positive and one negative results in eight patients under twenty five years of age and four positive and six negative results in ten patients between twenty six and thirty six years of age.

The author feels that ovarian roentgenotherapy for menstrual alterations unassociated with serious organic changes of the genital apparatus is a valuable means of treatment especially in those patients under twenty five years of age and in whom the amenorrhea has not exceeded three years.

GEORGE C. LINDA M.D.

Jeanneney, G. and Dervillée P. Gynecology and Accidental Injuries (Gynécologie et traumatismes accidentels). *Gynéc et obst.* 1937; 35 409

Jeanneney and Dervillée consider only the trauma to the female genital organs resulting from industrial or accidental injuries, not obstetrical trauma or trauma from abortion and operative procedures.

Among the traumas to the external genitals there are two types: contusions in the perineal region and impalements. Contusions in the perineal region usually are accompanied by hemorrhage and infiltration of the tissues with blood because of the numerous blood vessels in this region but usually these wounds even with extensive hematomata heal rapidly, only occasionally do they become infected. Occasionally also a cicatricial stenosis of the orifice of the vagina may result. Impalement results from a fall on a sharp object such as a fence picket. The results of this type of injury are serious if any of the viscera or the peritoneum is penetrated. Fortunately such accidents are rare. Silbermark in reviewing 224 cases, found lesions of the rectum or of the bladder in three fourths of the cases with a mortality of 6 per cent. In the cases in which the peritoneum was penetrated the death rate was 49 per cent. In continence of urine or feces or a vesicovaginal or rectovaginal fistula may result in the cases without intraperitoneal injury.

Trauma may of itself cause some irritation to the ovary and disturbance of its function. The effects of trauma on the tubes and ovaries are more serious however if there is a pre-existing infection or lesion which may be much aggravated by the trauma. Exacerbation of symptoms in a condition previously latent may be produced by trauma or trauma may cause rupture of an ovarian cyst, torsion of its pedicle or rupture of an ectopic pregnancy. In such case the severity of the symptoms may be disproportionately great.

The uterus because of its position and method of fixation is resilient and not greatly liable to injury. Both retrodeviation and prolapse of the uterus have been reported as resulting from injury but in most instances it will be found that there is some previous tendency to such displacements or some predisposing factor such as perineal tears, pelvic deformities and weakness of the musculature. In cases of retrodeviation occurring after trauma and considered due to the trauma it must be known that there was no retrodeviation previously and symptoms of sudden severe abdominal pain sometimes accompanied by bleeding and vomiting must have occurred immediately after the injury. Prolapse has been found to occur in young and multiparous women after trauma and in some of these cases in which the pelvis and the musculature were normal it was undoubtedly due entirely to the trauma. In others some predisposing factor has been evident.

Trauma to the female genital organs may be followed by a post traumatic syndrome which may be compared to the post traumatic syndrome following head injury. Menstrual disturbances and abdominal pain are the chief symptoms. The effect of emotion on the uterus and ovaries and especially on the menstrual function has long been recognized. It is probable that the emotion and commotion attending a severe injury act upon the ovarian function in a number of ways by producing vasomotor disturbances by disturbing the functions of certain en-

ever, whether temporary or permanent, a diet containing a full supply of organic iron is frequently not sufficient as a preventive measure, as iron in this form cannot be sufficiently utilized by a patient with a deficient secretion of gastric juice. Further, the occasional impossibility of detecting a considerable degree of anemia without hematological examination must be emphasized. All women during pregnancy should, therefore, be given inorganic iron, particularly during the last trimester. This should be a routine measure in all antenatal clinics.

The macrocytic deficiency anemia of pregnancy is not sufficiently common in this country to justify any change in the present antenatal routine. The association between deficient dietary and tropical macrocytic anemia should, however, be remembered when considering the severe dietetic restrictions which some authorities recommend for the prevention or alleviation of the toxemias of pregnancy.

Curative treatment The microcytic anemia of pregnancy responds to adequate iron therapy. Large doses of inorganic iron, e g, from 30 to 40 gr of iron and ammonium citrate three times a day, must be given throughout pregnancy and the puerperium. Straus and Castle found, in 30 cases of pregnant women with microcytic anemia and a hemoglobin level of less than 45 per cent, that the administration of 6 gm or 93 gr of iron and ammonium citrate, or of 1 gm or 15½ gr. of ferrous sulphate daily resulted in prompt recovery in every case. As Mettler and Minot have shown that an acid medium is more effective for the absorption of iron from the alimentary canal, 10 drops of dilute hydrochloric acid, increasing to 40 drops, should also be given three times daily particularly during the last trimester. Two facts should be noted first, that a more vigorous course of iron therapy is required in the microcytic anemia of pregnancy than in the corresponding achlorhydric anemia in non-pregnant individuals, and second, that if the gastric secretion does not become normal after pregnancy, in other words, if there is a permanent achlorhydria, inorganic iron must be continued for an indefinite period.

The plethora of pregnancy, which has been shown to increase as the pregnancy progresses, must result in a slower gain per unit volume than plethora in a non-pregnant individual. Straus and Castle found that the average gain resulting from massive doses of iron was 0.65 per cent hemoglobin per day. In similar cases (as yet unpublished) investigated by Kimbell and the author, the rate of progress was slower. Therefore, in those cases in which the hemoglobin level is below 45 per cent and the woman is within a few weeks of term, blood transfusion might be considered, as iron medication would not materially alter the hemoglobin content before the onset of labor. A suitable donor should be available during labor so that a blood transfusion could be given without delay if excessive loss of blood occurred. In those cases in which the anemia is complicated by a bone-marrow hypoplasia, which

fact is indicated by an unsatisfactory response to treatment, blood transfusion is of definite value. Artificial termination of the pregnancy in order to remove the fetal demands for hematinic materials is not justifiable.

General measures such as adequate diet and, in the severe cases, rest in bed, which are adopted in all anemias whatever the cause, are not considered in this article.

It should be noted that much of the chronic ill-health found in women of the child-bearing age is associated with microcytic anemia. Pregnancy, particularly a rapid succession of pregnancies, has been shown to precipitate such an anemia frequently. The importance, therefore, of the administration of inorganic iron as a routine measure at all antenatal clinics cannot be over-emphasized.

The treatment of the macrocytic deficiency anemia of pregnancy consists in ensuring an adequate supply of raw material to the bone-marrow. Intensive liver therapy, whether oral or parenteral, is usually sufficient, but cases are encountered in which anemia of this type is associated with deficiency of iron as well as of Castle's factors. In such cases liver therapy must be reinforced by the administration of inorganic iron. The addition of marmite to the diet of those patients in whom the gastric secretion is normal may result in rapid improvement, but it would seem safer in this country to institute liver treatment as soon as possible. As in the microcytic anemias, a more vigorous course of treatment is required in the macrocytic anemia of pregnancy than in the corresponding anemia in the non-pregnant individual. Also, if the secretion of gastric juice does not return to normal after pregnancy, treatment must be continued for an indefinite period. Blood transfusion is of value only as a temporary measure.

The deficiency anemias of pregnancy are to a certain extent self-limiting diseases, as they tend to improve spontaneously after labor. Artificial termination of the pregnancy should, however, never be required in macrocytic anemia unless some other complication, especially toxemia, co-exists.

As has been stated, liver, vitamin, and iron therapy do not affect the course of hemolytic anemia of pregnancy. Blood transfusion is the only effective measure, and often a single transfusion results in dramatic clinical improvement, as evidenced by return of the temperature to normal and cessation of the hemolytic process. Rous has pointed out that multiple blood transfusions may result in the development of autohemolysis. Consequently, when the administration of repeated blood transfusions is unavoidable, their use should be discontinued as soon as definite improvement results. Whether artificial termination of the pregnancy is indicated in this form of anemia is uncertain. Lederer's anemia, which is exactly similar to the hemolytic anemia of pregnancy in its clinical and hematological findings and in its therapeutic response, occurs in non-pregnant individuals. This,

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Tisserand M. The X ray in Obstetrics (La radiographie en obstétrique) *Gynécologie* 1937 36 201

Attempts to use the x rays for obstetrical diagnoses date back to the years immediately following their discovery. Since then a gradual development has brought numerous practical applications.

The chief uses of the roentgen ray in obstetrics are for (1) early diagnosis of pregnancy (2) differential diagnosis (3) diagnosis of multiple pregnancy (4) diagnosis of abnormal gestations (5) diagnosis of fetal death *in utero* (6) study of presentation and position in relation to the mechanism of labor (7) diagnosis of the age of the fetus and (8) pelvic and fetal mensuration. Methods of determining the presence of placenta previa, prolapse of the umbilical cord, and the sex of the fetus have recently been advanced by American investigators.

The author discusses the various technical aspects of radiography. He expresses preference for taking x ray exposures of the fetus and pelvis with the woman lying upon the abdomen. This position has three advantages: (1) it permits closer contact between the fetus and the plate; (2) it immobilizes the fetus; and (3) it pushes the intestines upward and toward the flanks.

With x rays the diagnosis of pregnancy can often be made as early as the third month and always after the fourth. Pneumoperitoneum and intra uterine lipiodol are used also for the early diagnosis. The author dismisses the former as not entirely reliable; the latter has dangers of producing abortion.

In problems of differential diagnosis from ovarian cyst, polyhydramnios, thick abdominal wall, pseudocyst, and myoma, the x rays may give valuable information. It is difficult to differentiate extra uterine gestation except by the eccentric position of the fetus. A lithopedion is easily distinguished.

Multiple pregnancies are easily distinguished even in the presence of a dead fetus or hydramnios. Fetal abnormalities such as hydrocephalus and anencephalus cannot be distinguished definitely before the sixth or seventh months because the ossification centers are too transparent before that time. Hydramnios which usually accompanies these anomalies does not interfere with the diagnosis.

Fetal death *in utero* is recognized by the overlapping of the fetal skull bones. In addition to this the finding of acute angulation of the vertebral column as well as reduction and effacement of the thoracic cage are diagnostic.

The presentation and position of the fetus and the various stages in the mechanism of labor are readily shown. The author describes the latter in detail.

The age of the fetus is determined from the appearance of the ossification centers and recently Thoms determined it by calculations from the occipito-

frontal diameter of the fetal skull. The author describes the various methods advocated thus far for roentgen pelvimetry. He points out that present methods give only approximate values.

Ammiography, i.e. outlining the non-osseous structures within the amniotic sac such as the cord, placenta, and fetal soft parts is mentioned. From injection of a radio opaque substance into the amniotic sac the location of the placenta, cord prolapse, and even the sex of the fetus have been recognized.

HAROLD C. MACK, M.D.

Evans E. H. Anemias of Pregnancy. *J. Obst. & Gynaec. Brit. Emp.* 1937 44 417

Some of the anemias of pregnancy have their origin in an obvious clinical complication such as hemorrhage or infection, and numerous cases are recorded in which the pregnancy itself is a complication of some pre-existing anemia. In addition it has long been recognized that pregnant women are liable to develop an anemic state which has no such obvious cause. A classification of the anemias of pregnancy follows:

1. Deficiency anemia

(a) Microcytic

- (1) With normal or only temporary deficiency of gastric secretion
- (2) With permanent deficiency of gastric secretion

(b) Macrocytic

- (1) With normal or only temporary deficiency of gastric secretion
- (2) With permanent deficiency of gastric secretion

2. Anemia due to hemorrhage

3. Anemia due to sepsis

4. Hemolytic anemia due to the action of a hemolytic agent of unknown origin

5. Anemia in which the pregnancy itself is a complicating factor

The author is chiefly concerned with the deficiency anemia and anemia due to the action of a hemolytic agent of unknown origin and outlines a course of preventive and curative treatment.

Preventive treatment. The most important conclusion which must inevitably result from a study of recent work is that the great majority of the anemias of pregnancy are preventable by adequate doses of inorganic iron. Microcytic anemia has been shown to be the commonest form of anemia occurring in pregnancy. This condition is cured and its incidence prevented by iron therapy. It is true that a deficient diet has been demonstrated to be an etiological factor in the production of the microcytic anemia of pregnancy; it is important to a pregnant woman that her diet contain a sufficient quantity of meat and green vegetables. Owing to the high incidence of achlorhydria in pregnant women how-

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Pérard, J., Léger, L., and Faulong, L.: Febrile Cancers of the Kidney (Les cancers fébriles du rein) *J d'urologie et chir*, 1937, 43 489

Pérard and his associates report a case of febrile cancer of the kidney in a woman thirty-nine years of age, who was admitted to the hospital because of a daily rise in temperature to 38.5° or 39° C associated with a loss of weight in the last few months, weakness, and increasing anorexia. She also complained of a pain in the left lumbar region radiating to the flank. A careful examination, including roentgenography of the thorax, showed no evidence of tuberculosis, of Malta fever, or of any infection. The daily fever was the first symptom noted, accompanied by malaise and sweats. The loss of weight and general symptoms began to be manifest a month or so later, then the lumbar symptoms developed. Urinary examination showed nothing abnormal, but an exploratory lumbar operation showed a renal tumor. Nephrectomy was done, and the tumor proved to be a malignant hypernephroma. After operation, the temperature became normal and showed no daily variations for six months. Then symptoms recurred and examination showed pulmonary metastases; the patient died ten months after the nephrectomy.

The authors note that the occurrence of fever in cancer of the kidney is rare, and especially so when the fever is a primary symptom and not associated with infection, as it was in their case. The first case of this type was reported by Israel in 1896. In 1911, Israel reviewed the literature on the subject showing the difficulty of correct diagnosis in such cases. Several cases reported since 1911 are briefly reviewed.

Excluding cases in which the fever was a symptom of the terminal cachectic stage, and considering only those in which the fever was one of the initial symptoms, the authors find that three types of fever have been observed: hectic fever, recurrent or remittent fever, and hematuric fever, i.e., attacks of fever terminated by hematuria. When fever is the chief symptom of a renal tumor, diagnosis is very difficult. The condition usually suggests a general infection, such as malaria, tuberculosis, or Malta fever. If the kidney becomes enlarged, or renal pain develops, pyelonephritis or a perirenal abscess or cortical abscess may be suspected. In the authors' case the absence of pus in the urine indicated that the condition was not a pyelonephritis. The exploratory operation was undertaken because a perirenal supuration or cortical abscess was suspected.

It has been found that cases of renal cancer in which fever is a prominent symptom run a rapid and malignant course. This may be due in part to the fact that the diagnosis is uncertain and operation delayed. In cases of fever for which no cause can be

found, the possibility of a renal lesion should be considered even if there are no local symptoms and a ureteropyelography should be done. Had this procedure been carried out in the authors' case, an earlier diagnosis might have been made.

ALICE M. MEYERS

BLADDER, URETHRA, AND PENIS

Gaignerot, J.: Radiography in Tumors of the Bladder (La radiographie dans les tumeurs de la vessie) *Arch. mal. d. reins et d. organes genito-urinaires*, 1937, 10 461

Radiography plays an extremely important part in the diagnosis of tumors of the bladder. Except for small polypoid tumors in which diagnosis can be made and treatment given by means of cystoscopy, all other tumors require roentgen examination of the bladder and generally of the kidneys also. The methods used include simple radiography of the bladder without any contrast medium, cystoradiography of the bladder after the introduction of a contrast liquid or gas, cystoradiography with colloidal, and intravenous urography. In cystoradiography with colloidal the colloidal is injected into the bladder and flocculates, leaving on the surface after evacuation a thin layer of thorium oxide which is opaque to

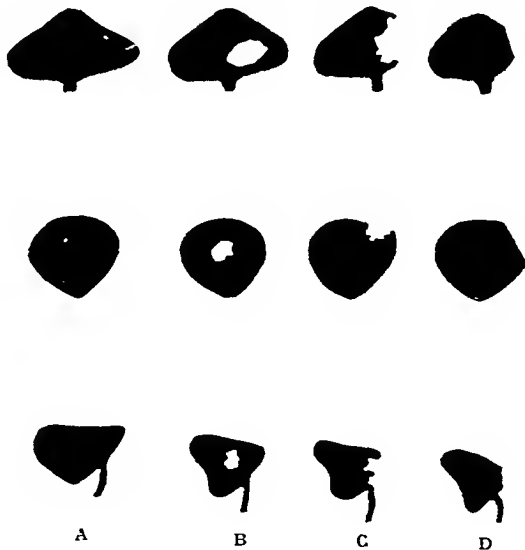


Fig 1. A. Normal bladder pictures. B. Central tumor images. C. Peripheral tumor images. D. Images of amputation by infiltrated tumors. The upper row of pictures represents frontal cystoradiograms, the middle row axial cystoradiograms, and the lower row profile cystoradiograms.

however does not necessarily refute the possibility that the fetus plays a part in producing the hemolysis. It would seem advisable in our present state of knowledge to try the effect of blood transfusions before terminating the pregnancy.

J. THORNWELL WITHERSPOON M.D.

PUERPERIUM AND ITS COMPLICATIONS

Snoeck J. and Rocmans M. *The Influence of the Retention of Fetal Membranes on the Morbidity of the Puerperium. A Contribution to the Study of the Indications of Uterine Exploration* (Influence de la rétention des membranes ovulaires sur la morbidité des suites de couches: contribution à l'étude des indications de la révision utérine). *Rev. franç. de gynéc. et d'obst.* 1937 31 304.

Snoeck and Rocmans include in this article only the retention of the fetal membranes and exclude all cases of partial placental retention.

The authors state that it is commonly believed that the retention of fetal membranes is responsible for the occurrence of postpartum hemorrhage and infection and also for delayed uterine involution. After reviewing the various opinions expressed on this subject the authors report their own experiences in the study of 1,020 labors which occurred successively during the period from 1932 to 1933 in the Maternity Clinic of the University of Brussels.

In order to interpret the results obtained correctly the authors subdivided their cases of labor mainly into three groups according to the following points:

1. Normal labors normal or dystocic labors followed by manual exploration of the uterus on account of retention of placental tissue or persistent hemorrhage and labors ended by the manual removal of the placenta or other obstetrical operations excluding cesarean sections.

2. Type of puerperium. Normal puerperia in which the temperature was less than 37.5° C. puerperia with first degree morbidity in which the temperature ranged between 37.5° and 37.9° C. puerperia with second degree morbidity in which the temperature ranged between 38° and 38.9° C. and puerperia with third degree morbidity in which the temperature was 39° C. or more.

3. Delivery of the membranes. Cases with complete expulsion of the membranes cases with incomplete expulsion of the membranes up to one half retained and cases with retention of the membranes more than one half retained.

From the results obtained it appears that puerperia were found to be febrile with second degree and third degree morbidity following normal labors in 12 per cent of the cases in which the membranes were apparently complete, 14 per cent of the cases in which the membranes were apparently incomplete and 66 per cent of the cases in which the membranes were completely absent. The corresponding total morbidity was shown to be 37, 40 and 66 per cent respectively.

From these results the authors conclude that after normal labors the incidence of pathological puerperia is the same in cases of complete expulsion as in cases with partially incomplete expulsion of the membranes. Complete retention of the membranes on the other hand seems to be an important factor of a febrile puerperium.

Uterine exploration should be resorted to only if there is a profuse and persistent hemorrhage which indicates the possibility of retention of a placental cotyledon.

Uterine exploration done in cases of partial retention of the fetal membranes does not influence the course of the puerperium favorably and does not prevent elevations of temperature and late hemorrhage.

RICHARD L. SOWERS M.D.

GENITAL ORGANS

Greco, A.: The Treatment of Malignant Tumors of the Testicle (*Sulla terapia dei tumori maligni del testicolo*) *Riv di chir*, 1937, 3 125

Greco reports thirteen cases of testicular tumors, twelve seminomas and one adenocarcinoma, operated on by Stoppato of Florence and afterward treated by roentgentherapy. In one case the radical operation was attempted, in the others an orchidectomy with high resection of the cord was done. Although radiotherapy was supposed to begin immediately after operative recovery, four patients delayed until metastases were evident. One patient died of angina pectoris nineteen months after operation, without signs of metastases. One with probable metastases disappeared five months after operation. Four died of metastases. Eight are living and in good condition, one who had had adenocarcinoma after eight years, two after seven years, and the rest after periods of from one to three years. Three of the five patients who had demonstrable metastases at the time of operation are living after periods respectively of one, three, and seven years.

The author presents the case of orchidectomy followed by radiotherapy in preference to the radical operation. The latter is not currently used in Italy. Although it is logical theoretically, its limitations are numerous and important, and the remote results are far inferior to what would be expected. In Greco's opinion Hinman's statistics are too favorable to the radical operation, chiefly because the successful results are attributed exclusively to it and the factor of irradiation is considered insufficiently. The operation is technically possible only when lumbar or epigastric metastases are absent, and in these cases orchidectomy would have been equally efficient. The position of surgeons who wish to limit the radical operation to teratomas, in which radiotherapy is useless, although Greco does not entirely agree with this viewpoint, is unrealistic because the specific nature of the tumor cannot always be determined before operation.

Greco reviews some of the European literature on the radiotherapy of testicular tumors. Radiosurgery is the most powerful and efficient method which is available at present, although only in a few cases, followed long and carefully, has a permanent cure been secured with its use. The treatment has no contra-indications or limitations, and because of the immediate benefit it should be carried out even when the ultimate prognosis is hopeless.

The article is accompanied by tables and a bibliography.
M E MORSE, M D.

MISCELLANEOUS

Ferguson, R. S.: Results of Treatment of the Genito-Urinary Tumors by Roentgen Rays. *J Urol*, 1937, 37 823

The author presents a record of cures obtained by external irradiation which compare favorably with

final sounding until this contraction begins differs in the individual cases but is uniform after every dilatation for each case. A mistake was formerly made in asking all the patients to come back after six months. In many cases considerable retraction had occurred and the patients had a very poor opinion of the value of urethrotomy. Each patient should be treated individually and the time after which retraction begins determined. This is done by passing the last number of bougie twice with an interval of three days between. The patient is then told to return after six days, twelve days, twenty-four days, and so on, until the time of beginning stricture is determined. After his period has once been determined it is sufficient to have him return exactly at the end of that period. Constriction will then not have begun and the same number of bougie can be passed. It need be passed only one time and the patient is then free until the termination of the next period.

The only exception to this rule is in strictures of the anterior third of the penile urethra which generally recur rapidly, these patients are given a Beniqué bougie of the proper calibre which they are allowed to pass themselves.

AUOREN GOSS MORGAN, M D.

Brunati, J.: Surgical Tuberculosis of the Penis (*Forme chirurgicale de la tuberculose du pénis*) *Res de chir*, Par, 1937, 56 213

In this article Brunati considers particularly primary tuberculosis of the penis. While admitting that tuberculous infection may reach the glans penis either by way of the blood stream or by direct contact with lesions of the cervix or vagina of the female, the condition is considered primary when exhaustive examination fails to reveal a focus of infection in the lungs or genito-urinary tract of the patient.

The treatment of choice is excision of the lesion providing the diagnosis has been made early in the disease or if the individual is past the period of childhood. Purely medical treatment gives less satisfactory results because of the extensive destruction of tissue. There is also the disadvantage of possible recurrence and of transmission of the disease. Caustics should not be used, intravenous injections of arsenical preparations or intramuscular bismuth should be made only if concomitant syphilis is suspected. In the patient treated by Brunati, a soldier aged thirty years, medical treatment led to considerable ulceration with consequent serious damage to the urethra.

Tuberculous lesions must be differentiated from carcinoma, syphilitic or soft chancre, and phagedenic ulcer. The lesion is usually close to the meatus or frenum on the inferior surface of the glans. The ulceration is irregular, ill defined at the edges, the base is bluish in color and covered by caseous material and secretes serum or seropus. In its earlier stage, the lesion is described as a little white button which breaks down to the typical ulcer.

MARSH W POOLE, M D.



Fig 2. Cystoradiography with opaque substance. Tumor of the bladder. Peripheral image vegetating tumor.



Fig 3. Cystoradiography with colloidal. Malignant tumor which has ulcerated and infiltrated the right wall of the bladder.

x rays. The details of the technique of this method are described and also of a second technique in which the injection of colloidal is followed by the injection of air into the bladder. The bladder covered with the thin layer of colloidal and distended with air is then roentgenographed from in front and in the three quarter oblique position. This method is not at all dangerous and gives very interesting results.

Roentgenograms are taken from in front and in the oblique profile and axial positions. The substances most used are subnitrate of bismuth, gelobarin and colloidal. At least two views are always taken, a frontal and a sagittal or oblique, each one with moderate distension and with a small amount of liquid. These roentgenograms will show peripheral images of tumor with notches or amputation of the image as with a knife or central images. These are illustrated.

Cystoradiography may show in addition to the image of tumor a reflux from the bladder into the ureter, the passage of liquid into the large intestine or the presence of a diverticulum in which the tumor has developed. Intravesical or ureteral tumors protruding into the meatus always require a special examination. If the orifice is visible and permeable an ascending ureteropyelography may be practiced. If this method of examination is impossible intravenous urography may be performed with Uroselectan B.

These examinations will show either integrity or more or less marked dilatation of the ureter and pelvis or the irregular images characteristic of tumor of the pelvis or ureter or possibly of both. Radiography shows the size and site of the tumor and particularly the degree of infiltration. These findings inform the surgeon as to whether he must perform a complete removal or a simpler operation such as

intravesical fulguration or cystostomy. The condition of the ureter is still more important. If the ureter is normal it may, in spite of the proximity of a tumor, be resected and implanted almost *in situ* or a little higher up, but if there is considerable dilatation of the ureter or pelvis or tumor in these organs a total nephro-ureterectomy must be performed.

ALFRED GROSS MORGAN, M.D.

Mihailovici I. Operative and Postoperative Treatment of Inflammatory Strictures of the Urethra (Contribution au traitement opératoire et post opératoire des rétrécissements inflammatoires de l'urètre). *J. d'ur. méd. et chir.* 1937 43 439.

The author finds that temporary or permanent cystostomy is only rarely indicated in cases of stubborn stricture complicated by fistulas. The method which he has found most effective in the great majority of cases is an internal urethrotomy with a Maisonneuve urethrotome with two unequal blades. The first incision is made to the left of the midline with the smaller blade and the other to the right of the midline with the larger blade. After that a No. 20, 21, or 22 sound is introduced and retained for three days or in cases of callous or multiple stricture particularly of the penile part of the urethra for six days. Ordinarily four days after the sound is removed dilatation with bougies is begun and continued daily, increasing the number of the bougie by one each day. This treatment is generally well borne.

Some patients have a fever of from 35.5 to 39, but it yields readily to quinine. Generally there is not much hemorrhage and in the cases in which hemorrhage occurs it is controlled by injections of calcium. The maximum dilatation is generally attained in about two weeks. After a time the stricture begins to contract again. The period from the

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS

CONDITIONS OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC

Annovazzi, G.: Observations and Data Assembled in the Base Hospital Unit No 540 in Somaliland (Osservazioni e dati raccolti nell'ospedale da campo N° 540 in Somalia) *Chir. d'organi di morimonto*, 1937, 22 528

Annovazzi's observations refer exclusively to soldiers who were wounded during the battles of Harrarino from April 24 to April 30, 1936

After having classified in tabular form the types of wounds observed, the author states that in general the condition of the patients was good. The local condition of the wounds was less favorable. The wounds were often contaminated with sand and in several instances there was a profuse purulent discharge. In the natives the wounds were often found to be infected with vermin. This was due mainly to the excessive heat, to the constant wind, and to the failure of frequent medication.

The author cleansed and disinfected the skin surrounding the injury with benzine, alcohol, and tincture of iodine. The dressings were changed daily. The probing of tracts was strictly avoided. Wounds with tortuous tracts were débrided and drained with glass or rubber tubes, and frequently irrigated with Dakin's solution.

Fractures were more difficult to treat because of the absence of roentgenological control. These types of wounds, therefore, were first cleansed, the fracture was then reduced, and a cast applied. In cases in which the wound did not heal, extensive débridement was performed. Digital examination in these cases revealed almost always a comminuted fracture in which the minute fragments had been projected into the surrounding muscle tissue. No attempt was made to extract movable foreign-body fragments. No traction devices were available and the treatment of fractures was therefore often very difficult because the necessary devices had to be improvised from whatever material was on hand.

In 4 natives, bullets were extracted. In these cases the site of lodging of the bullet could not be identified from the surface. The bullet was usually localized by determining the site of the pain or by inserting a probe along the fistulous tract produced by the projectile. In these latter cases the extraction was often very difficult.

Concerning cicatrization of the wounds, the author observed in general that in the natives this process was much retarded, in part probably due to the climate and in part to the impossibility of keeping the wounds clean. Also nutritional and hereditary factors probably came into play.

The author observed a remarkable endurance of pain on the part of the natives so that incisions could be carried deeply and débridement was performed

easily in the absence of anesthesia. Some of the natives had the habit of introducing their hands under the bandage and removing drainage tubes and packs.

Most of the native patients had the habit of exposing themselves to the sun during the afternoon hours. Lying unprotected in the sand, their wounds often became contaminated and healing was consequently delayed.

One transfusion should have been given because of severe hemorrhage from the popliteal artery, but no donor could be found among the natives because according to their laws no blood can be donated.

Some difficulties were encountered with regard to food because the natives refused to eat any lamb derived from an animal which had not been killed according to the rules set forth by the Koran and therefore strict dietetic rules could not be carried out.

RICHARD E. SOMMA, M.D.

Lowrey, J. M., and Booth, J. H. R.: Osteopathia Condensans Disseminata (Spotted Bones). *Am J Roentgenol*, 1937, 37 774

The authors elucidate and analyze the nomenclature of this condition and related lesions and report an additional case.

This disease is a pathological condition characterized by dissemination of areas of condensed bone elements.

There are 45 cases found in the literature, most of them emanating from Europe. Stieda reported the first authentic case in 1905.

The lesions show in the roentgenograms as spotted areas, white splotches, of condensed bone.

DANIEL H. LEVINTHAL, M.D.

Zwerg, H. G., and Laubmann, W.: The Marble Disease of Albers-Schoenberg (Die Albers-Schoenbergsche Marmorkrankheit). *Ergebn. d. med. Strahlenforsch.*, 1936, 7 95.

Since 1904 when Albers-Schoenberg reported this disease a total of 55 cases have been reported. The condition is characterized by a generalized endosteal osteosclerosis. Roentgen findings include a lack of differentiation between the corticals and the spongiosa, a bare indication of a narrow cavity, circular lines on the metaphysis, a lamellar stratified appearance, plum-sized areas of decreased shadow-casting substance in the bones of the ankle producing a dappled effect, occasional periosteal appositional seaming, marked sclerosis and thickening of the base of the skull, and absence of pneumatization of the bones of the face. The vertebrae appear to have three strata, a middle layer with bony structure still evident and two surrounding strata which are sclerosed. The tendency to fracture of the bones, osteosclerosis fragilis generalisata, is not explained either dynamically, by brittleness, or histologically.

results of previous methods of irradiation. He reports on a series of 36 low grade multiple tumors of the bladder treated from two to four years previously. Twenty of the patients are now without evidence of disease. From additional scattered cases it appears that in 81 patients, most of them with inoperable carcinoma of the bladder, a complete regression of the tumor and freedom from disease has been secured for from three to five years with external irradiation alone. Regarding tumors of the kidney, 16 patients with inoperable or recurrent hypernephroma are alive and well after five years. 5 Wilms tumors were controlled for three years and 2 papillary carcinomas of the renal pelvis and ureter were controlled for three years or more. Four of the patients with Wilms tumors are now alive and without evidence of disease and the 3 with carcinomas of the renal pelvis died from other causes. There are scattered case reports of favorable results after treatment of cancer of the prostate by the newer techniques of irradiation alone. The average high radiosensitivity of the tumors of the testis makes the choice of irradiation rather than surgery imperative. The prognosis of inoperable genito urinary cancer has brightened materially because of a better understanding of the physical properties of the roentgen rays and the biological behavior of the various tumors in response to treatment by divided doses.

With the former technique of irradiation the damage to the skin made subsequent treatment impossible and the dose delivered to the tumor was usually insufficient except in the cases of the very radiosensitive embryonal carcinoma of the testis. Today the treatment of most deep seated genito urinary tumors is accomplished with either the 200 or the 900 kilovolt machine. The filtration has been increased on the 200 kilovolt machine to the equivalent of from 1.5 to 2 mm. of copper and with the supervoltage machine greater filtration is generally used with the doses of from only 100 to 300 roentgens daily. This provides additional protection to the skin. The target distance has been increased to 70, 100 or even 150 cm. and permits a much larger percentage of the dose at a depth of 10 cm. in the

body. The skin portals have been decreased in size and increased in number as a result of which still further protection to the skin and an increase of the total dose to the tumor is obtained. With this modern technique the equivalent of from 4.5 to 9 skin erythema doses can be delivered at a depth of 10 cm. in contrast to the meager 1.5 skin erythema dose with the former technique.

It has been found that the more radioresistant the tumor, the greater the necessity for more prolonged less intense irradiation at smaller daily doses. Conversely, the biological characteristics of the radiosensitive anaplastic tumors demand a more intense irradiation with large doses over a shorter time. The matter of radiosensitivity or radioresistance is relative to many factors other than the microscopic appearance of the tumor. Some tumors treated with the old techniques of external irradiation appeared to be wholly radioresistant but now they are regarded as radiosensitive. In other words, a given tumor may prove radioresistant with one radiologist and prove completely sensitive with another using adequate doses. Tumors also vary in radiosensitivity with respect to the presence or absence of infection, the general condition of the patient, the extent of the disease and the period in the life history of the tumor at which treatment is given.

Complications take the form of chronic induration of the skin and may leave a permanent fistula as in the bladder. These complications may be avoided with heavier filtration, smaller daily doses and a smaller total dose to the skin. With the 200 kilovolt machine such accidents are rare. Minor complications include an increased frequency of urination especially in the presence of infection which usually passes within two or three weeks and rectal mucositis. These are relieved by starch enemas, opium suppositories and warm sitz baths. Irradiation sickness is prevented by the administration of liver extract intramuscularly every second or third day during the treatment. Permanent damage to the renal function or any severe temporary damage to the kidney has not been observed.

LEON V. SEYMOUR, M.D.

less often than in cases of longer duration. The other two tests showed approximately similar results in each group. The sedimentation rate was slightly more accurate in severe than in mild cases. The Vernes test was markedly so, while the other two showed very little difference.

The authors' results agree in the main with those reported in the literature. From the standpoint of practicability and accuracy, the sedimentation rate is the most useful laboratory test thus far in common use to aid in the recognition and evaluation of active rheumatoid arthritis.

CHARLES BARON, M D

Paas, H. R.: The Etiology and Critical Problems of True Arthritis Deformans. Clinical and Experimental Research on the Physiology and Pathology of the Capsular Ligament (Ätiologie- und Schmerzprobleme bei der genuinen Arthrosis deformans. Klinische und tierexperimentelle Untersuchungen über die Physiopathologie der Gelenkkapsel). *Arch. f. klin. Chir.*, 1937, 188, 1.

In considering true idiopathic arthritis deformans the concept is set forth that there is an inseparable biological unity between the soft parts of joints and bones and synovial membranes and cartilage, and the lesions of arthritis cannot be considered solely in the sense of isolated degenerative processes. This article includes 210 different cases of deforming arthritis observed for a period of over eight years. Of this number 167 of the shoulder, elbow, hip, and knee joints must be regarded as secondary rather than primary forms. The remaining 43, about 20 per cent of the whole, were true cases. A third of these were in the fifth, sixth, and seventh decades of life. From these numbers an idea of the amount of deforming arthritis other than the classical form of the true arthritis deformans may be gained. The author observed that the subjective complaints and the amount of objective deformity were often in striking contrast. A high-grade arthritic finding in the roentgenogram was the exception, and it is a great error to judge from the roentgenogram alone without consideration of the strength of the complaint and the injury to the joint function, and without consideration of the amount of motion which may have been acquired. The phenomena which result in organic changes in the joint apparatus are manifested early in an altered permeability of the synovial membrane and in an imperfect production of synovial fluid. The important question rises whether these capsular changes and disturbances of the nutritive unit should not be regarded as the exciting factors responsible for the deformity, and not solely as accompanying or secondary phenomena of the degenerative process going on in the joint apparatus. The author employed experimental investigation and ratified the conclusion made by Müller and Lauber that with otherwise completely equal conditions the absorption time of injected contrast fluid was regularly increased with advancing age of the animals. The same was true in man. With advancing age comes an ever-advancing change in the

joint capsule. The connective tissue change progresses to an abatement of elasticity, and to a shrinking process from which comes a reduction of the joint surface capable of absorption. In idiopathic arthritis deformans the delay in absorption often approaches two or three times the normal. From a study of 19 knee joints in this classification, and from 14 found in 7 patients, in whom both knees were involved, it was observed that the objective finding of a small degree of primitive cartilage went hand in hand with a greater delay in absorption from the joint capsule. It therefore follows that a high grade of arthritic deformity and delay in absorption are not concurrent, but rather delay in absorption and strength of the arthritic complaint are concurrent.

Summarizing, the conclusion is reached that with true arthritic joints the changes described in the joint capsule are the outstanding causes of the beginning of the deformity. All the investigated joints had within them a strong pressure beyond the normal and a greatly increased tension of the capsule. This the author has pointed out before. Delayed absorption and increased pressure go hand in hand in a true arthritic joint. Both suggest an active progression of the joint-deforming process and an unfavorable prognosis. All the research findings point out, therefore, that with arthritis deformans and, indeed, with the other deforming arthroses, the deficiency of circulation, the lessened elasticity, and the shrinking of the capsule stand in the foreground as causes of the pain. Therefore, the nucleus and basis of rational therapy must be sought in these tissues. A biologically efficient method of treatment based upon these principles and carried out by means of injections into the joint is recommended.

(BODE). HAWTHORNE C. WALLACE, M D

Kushizaki, S., and Saito, K.: Contribution to the Knowledge of Primary Muscle Tuberculosis (Beitrag zur Kenntnis der primären Muskeltuberkulose). *Beitr. z. klin. Chir.*, 1937, 165, 177.

Primary muscle tuberculosis is produced by metastasis through the blood stream, the bacteria being brought to the skeletal muscles from a distant focus. The authors observed two cases of this unusual malady. The first case occurred in a twenty-four-year-old merchant in the form of an abscess in the right pectoralis major; this healed in two months following curettage and tamponading with iodoform gauze. In the second case the infection appeared in all four extremities as hard, elongated swellings varying in thickness up to that of the last phalanx of the thumb, and resembled the so-called fungoid-sclerotic myositis. This latter type of primary muscle tuberculosis, according to Zahnert was observed in only two cases. The treatment consisted of excision of the swellings under local anesthesia, followed by roentgen-ray exposures. The primary tuberculous infection in the first case could not be established with certainty; in the second case the roentgenograms showed the glands in the hilus of the lungs as the most probable focus of the infection. Primary-muscle tuberculosis

However, this condition differs from the other forms of osteosclerosis in that the fractures heal more rapidly because of an increased power of the bones to take up calcium. Pseudarthrosis is not common. The blood picture reveals secondary changes which lead to severe anemia in which the reticuloendothelial tissues may develop a chronic phase of overgrowth with an almost embryonal blood picture. The characteristic feature is a disturbance of erythropoiesis but a leukemic picture may be present. Other chemical findings include optic atrophy due to massive thickening of the processes and blindness. Labyrinthine deafness and suppuration of the lower jaw with extensive formation of sequestra are rare. Occasionally there is an elevated blood calcium level with normal calcium in the urine, however there is an abnormal giving off of calcium to the bony tissues as a result of increase in osteoid tissues because of a primary disturbance of the function of the osteoblasts. The condition shows a preference for childhood and youth and has an unfavorable prognosis. There is a malformation in the construction of the bone which is the result of a disturbance of the endochondral growth with retarded though continuous production of primary osteoid trabeculae in the absence of the preliminary resorption of all the original cartilage. Coincidental disturbances in the building up of the compact bone appear lamellar in some places in others not. It is this defect in the bone that causes the fragility. Genetically one assumes a formative, osteoplastic stimulus as in the case of strontium osteo sclerosis or phosphorus osteo sclerosis. The stimulus cannot however be exogenic as there is an unquestionable intrauterine origin of the disease the condition occurs in siblings. Ultimately however a primary disturbance of ossification must be assumed as the basis of the condition which is to be regarded as a congenital malformation. As differential diagnostic points the authors mention that uniform distribution throughout the entire skeleton is absent in the inflammatory osteoscleroses while in marble disease the periosteal reaction is absent. Osteitis fibrosa generalisata and Paget's disease may usually be distinguished by the occurrence side by side of porotic and of hyperostotic structures and the osteitis particularly by the absence of the Schmorl mosaic structures. Rachitis seldom presents the extensive sclerosis and may usually be recognized by its osteoid characteristics. The cause of death is the frequent suppurative processes of the bone. Dental caries must be watched for and timely extraction effected. On account of the osseous fragility sports should be forbidden. Marriage between blood relatives should be forbidden and in other marriages in which signs of the disease are present birth control should be advised.

(STEVENS) JOHN W. REYNOLDS, M.D.

Lewis D. and Geschickter C. F. Sclerosing Sarcoma of Bone. *Arch Surg* 1937 34 1010

The author reports 158 cases of sclerosing sarcoma of the bones. A sarcoma of this type may develop in

any of the bones of the skeleton but it develops relatively rarely in any but the long bones. Four sarcomas involved the skull, 10 the jaws, 3 the vertebrae and the pelvis and 4 the scapula. None developed in the bones of the hands or feet. Seventy-two of the sarcomas developed in the lower ends of the femurs or the upper ends of the tibia.

There were 28 patients from fourteen to fifteen years of age, 68 from fifteen to twenty-four, 14 from twenty-five to thirty-four years, and only 12 over thirty-five years of age.

The tumors ran a relatively acute course the duration of symptoms was rarely more than six months. Pain, swelling and impairment of function appeared in the sequence given. Trauma was mentioned with the appearance of the tumor in 50 per cent of the cases. Pathological fracture was rare. Fever and leucocytosis were noted less frequently than in Ewing's sarcoma. Nothing of especial significance was revealed by physical examination in the early stage.

The final diagnosis was based on the roentgen and microscopic findings. In the long bones the tumor developed in the end of the bone on the shaft side of the epiphyseal line. Sclerosing osteogenic sarcoma was frequently not diagnosed in the early stages, as there was a tendency to attribute the symptoms to bursitis, neuritis or some allied condition. If roentgenograms were made the diagnostic significance was not recognized.

The final differentiation of sclerosing osteogenic sarcoma from other varieties of sarcoma of bone was made by microscopic examination. One hundred and six patients were followed for a period of more than five years or until fatal termination of the disease. Seventeen percent were living beyond the five year period. No cures followed irradiation. Prior to 1917 before irradiation was employed to any extent the percentage of five year cures was nearly twice as high as in the past decade.

In the various types of osteogenic sarcoma metastases of the tumor to other bones was extremely rare.

A careful study of sclerosing osteogenic sarcoma in its earliest phases indicates that the most characteristic location of the tumor is in the bone itself in its cancellous or cortical portions. The sunburst and periosteal manifestations appear late.

Richard J. BEVY, Jr., M.D.

Short C. L., Dienes L. and Bauer H. Rheumatoid Arthritis. A Comparative Evaluation of the Commonly Employed Diagnostic Tests. *J Am M* 137 1937 103 1037

On a group of 49 patients with active rheumatoid arthritis the sedimentation rate was found to be positive in 92.2 per cent and the Schilling count only slightly less accurate 87 per cent. The Werners test and streptococcus agglutination reactions were positive in approximately 50, 58.3 and 55.2 per cent, respectively.

In cases of a year's duration or under the sedimentation rate and the Schilling count were positive

the intervertebral discs. The author calls attention to the displacement of the disc tissues into the spinal canal, which occurs with especial frequency in the lower lumbar and the cervical sections of the spinal column. In most instances the displacement results from a predisposition thereto by antecedent alterations in the disc itself, and the injury producing the prolapsing intracanalicular displacement is to be regarded merely as the proximate cause.

Aside from the concurrence of a general predisposition and of senescence, mechanical factors seem to be of the most significance in the fibrocartilaginous changes. The interarticular disc which has been damaged by the two former factors is unable to withstand any more than ordinary mechanical demands. Therefore, in cases of injury to the interarticular fibrocartilages, each case must be studied by the medicolegal consultant on the basis of the consideration of the factors here discussed. A microscopic study of the injured tissues is of the greatest value (STELZER). JOHN W. BRANNAN, M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Dychno, A : The Comparative Value of Tendon Sutures, and the Presentation of Two New Techniques (Sur la valeur comparée des différentes suture des tendons avec présentation de deux nouvelles techniques) *Lyon Chir.*, 1937, 34, 304.

The author evaluates the various types of tendon sutures.

A satisfactory tendon suture should be strong enough to overcome muscular contraction, maintain normal anatomical relationships, and assure a sufficiency of blood at the point of division.

Side-to-side sutures are not satisfactory. Tendon suture techniques which require many loops of suture material at the site of the lesion, or the localization of sutures on the surface of the tendon, predispose to the formation of adhesions.

The author presents two methods of tendon suture which combine the good points of the techniques of Cuneo, passing the suture through the substance of the tendon, and of Lange, keeping the ligatures away from the point of division of the tendon.

The two techniques of the author consist in starting the suture away from the point of division and passing either obliquely or transversely through the substance of the tendon. The needle is re-inserted through the opening made at its point of exit (Figures 1 and 2). These methods conserve the tendon sheath better than others and do not prevent the blood from reaching the point of suture.

In the consideration of tendon suture, the problem of separation caused by muscular contraction is of great importance. It is necessary to know at the time motion is started postoperatively that the suture will withstand the pull of the muscular contraction. To avoid adhesions the optimal time to start motion should be immediately after operation.

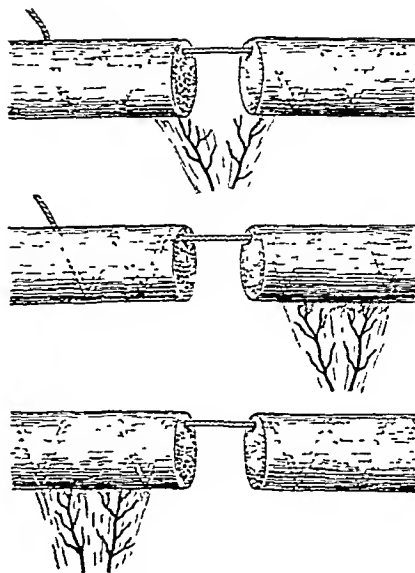


Fig. 1 Suture of the tendons by the first technique of Dychno. This figure represents the tendon suture of one side, the opposite side is sutured in the same manner. The techniques of applying the sutures vary according to the localization of the wound with relation to the vessels.

The author used tendons of equal size, removed from cadavers, and tested the strength of all types of suture. He found the tendons sutured by his own first technique to be strongest, those by Lange the next strongest, and his second technique third in strength as compared to others. He found in most instances that if the tension had been increased progressively the tension suture showed more strength than when the tension had been increased suddenly.

The author tested the muscular strength of the second, third, and fourth fingers of 35 subjects, and

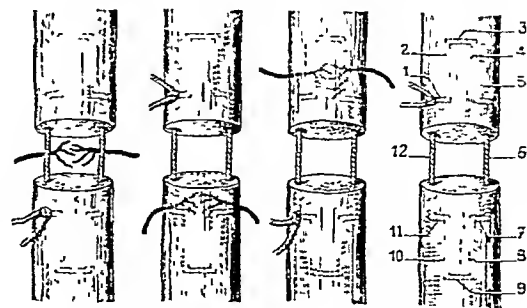


Fig. 2 Suture of the tendons according to the second technique of Dychno. The drawing at the left represents the order in which the sutures are applied. The 3 others show the localization of the sutures with relation to the vessels which enter the tendons through the mesotendons.

occurs more frequently in the extremities than in the trunk and oftener in the male than in the female. It occurs most frequently in younger persons the average age of the patients being 26.6 years. In addition to the two types quoted the nodular form of this disease which is a pathologic anatomical oddity must be mentioned. Histologically the muscle tuberculosis starts with a tubercle formation in the intima of the intramuscular vessels. To this usually is added a tuberculous infiltration in the interstitial connective tissue while the muscle fibers are subjected to pressure atrophy or to a proliferative degeneration. To date no pre operative diagnosis has been made as this can be done only by histological and bacteriological methods.

Conservative treatment was given in the form of Bier's method tuberculin injections puncture of the abscesses followed by injection of a 10 per cent aqueous form glycerin and roentgen ray therapy. A definite result may be expected only by resorting to a radical operation.

(KEMPF) MATTHIAS J. SEIPERT MD

Danckelman J. A. Spontaneous Rupture of the Long Extensor Tendon of the Thumb (Ueber die Spontanruptur der langen Daumenstrecksehne). 61. Tag d. deutsch. Ges. f. Chir. Berlin 1937.

Spontaneous rupture of the long extensor tendon of the thumb was first observed in the eighties of the last century as an occupational injury in drummers in the army. It was first recognized as a rare but typical late result of fractures of the radius in 1914 and since then about 30 cases have been described. To these observations are added 7 similar cases from the Charité Hospital which occurred in the last five years. All of the 7 ruptures following a fracture of the radius occurred in women between the eighth and eleventh week after the fracture which was barely dislocated and was usually difficult to demonstrate. The most likely cause was an injury of the tendon at the crest of the radius due to severe stretching at the moment of the fall. This early injury gradually led to the rupture through attrition. Five women were operated upon the last 3 with uniformly good results by bridging the defect with a freely transplanted piece of tendon from one of the long extensors of the toe.

In the discussion KOEHN reported 2 late ruptures of the long extensor tendon of the thumb after a fall on the left hand with the thumb tucked under. In the one case in a woman aged thirty two the injury of the thumb was visible as a small splinter on the first metacarpal bone there was no laterally displaced fracture of the radius as a result of longitudinal jolting. In the other case a woman aged sixty seven had fallen upon her left hand with the thumb tucked under and showed a slight injury of the outer cortex of the radius. After about three months the long extensor tendon of the thumb ruptured. At operation the distal end was thickened like a club and the central end had retracted completely into the substance of the muscle so that a

tendon sheath had to supply the bridging of the torn stump of the tendon. Although the operation had been done barely two months before the result was good even though at present the motility had not completely returned. Both of these cases show that the tendon of the extensor pollicis longus was excessively stretched during the fall upon the hand as a result of the thumb being tucked under. This stretching was still further increased by the reflex tension of the muscle during the fall. The tendon received a tear which finally as a result of the traumatic inflammation and the subsequent use of the long extensor tendon of the thumb developed into a complete rupture of the tendon. The knobby thickening at the peripheral stump can hardly be explained in any other way than as a chronic tendinitis. No unevenness in the gliding surface was observable although a thorough search for it was made.

LOUIS NEUWELT MD

Siegmund H. Pathological Anatomy of the Alterations of the Menisci and Interarticular Discs (Zur pathologischen Anatomie der Menisken und Band cheilungsveränderungen). 126. f. orthop. Chir. 1937 37 365.

The author reports his studies on the interarticular discs of the knee sternoclavicular claviculoscapular and manubrial joints and the intervertebral discs of the spinal column. The menisci and capsule of the knee joint are frequently involved in every sort of septic general infection in scarlatina puerperal fever and articular rheumatism. The alterations due to diabetes disease of the kidney cancer and atherosclerosis in the interarticular discs are not easy to distinguish from those due to advancing age. Fatty changes calcification and cloudy swelling of the interarticular discs seem to be characteristic of senile changes they are induced by local metabolic disturbances and are in an intimate relationship with the mechanical demands made upon them.

The findings on the sternoclavicular joint have shown that even as early as following the age of twenty five signs of degenerative processes in the fibrocartilaginous tissues of the interarticular disc may frequently be observed and after the age of forty these signs are even more pronounced.

The manner in which variations in involvement and activity of a joint as a result of more than ordinary demands upon it may lead to alterations in the structure of the fibrocartilage was made a subject of study in cases of abnormal bite of the jaw bone e.g. a malaligned healing of mandibular fracture. In addition to the changes in the interarticular disc marked alterations of the joint surfaces in the sense of an arthrosis deformans finally develop.

The same changes may be noted in the intervertebral fibrocartilages. Changes in appositional relationships of the bearing surfaces due to the intra vertebral development of tumor metastases long continued inflammation and particularly severe mechanical demands on many parts of the spinal column conduce to marked degenerative changes in

result of increased pressure of the astragalus against the malleolus of the fibula in the foot which is growing and inclining internally. The talus is flexed plantarward and the external malleolus is very prominent. Also in pes cavus a thickened external malleolus extends externally and posteriorly. Especially in pes cavus a residual supination of the talus is often the cause of recurrence. Because of the displacement of the talus the external malleolus tends to extend posteriorly, while the talus becomes narrower posteriorly. The position of the talus may be influenced from the bifurcation between the malleoli. Reduction alone will not assure a permanent result, particularly in the case of adults. The mortise between the malleoli must be sprung so that the talus may be turned back. Furthermore, the external malleolus must be pushed forward. This may be accomplished by the following procedures:

An oblique osteotomy of the fibula is done 6 cm above its tip, the external malleolus is loosened from its ligaments, the joint between the tibia and the fibula is resected, and when necessary the ligamentous attachments of the internal malleolus are displaced downward and the talus is narrowed on its external aspect. The external malleolus may then be pushed forward 1 or 2 cm, its tip can usually be retained. It is fixed in its new position by strong catgut sutures. The foot is fixed in a slightly overcorrected position with plaster-of-Paris, and after from six to eight weeks is capable of function.

Clinical histories and roentgenograms are presented of 20 cases operated upon in this fashion since 1925. The results are satisfactory, the talocrural joint sustains the surgical manipulation very well. It was possible for the patients to stand on the toes of the operated foot. After ten years no arthritic changes were noted.

(VON DANCELMAN) JACOB E. KLEIN, M.D.

FRACTURES AND DISLOCATIONS

Magnus, G.: *The Nature and Treatment of Pseudarthrosis (Wesen und Behandlung der Pseudarthrose)*. 6r Tag d. deutsch Ges f. Chir., Berlin, 1937.

Pseudarthrosis means the cessation of fracture repair without firm union. Three etiological factors are mentioned: deficient callus production, structural defect due to tissue loss, and constitutional imbalance. The author observed pseudarthrosis in 3.8 per cent of leg fractures, although Koenig did not note a single case in a series of 1,200 corresponding fractures. A deficient production of callus which causes pseudarthrosis results if the substances necessary for new bone formation cannot be brought to the fracture site. A large group of general causes have been blamed, but only starvation and scurvy are constant and indicative of a Vitamin C deficiency. The rôle of the hormones is uncertain; results have been obtained with thyroid therapy, although the theoretical and experimental proofs are lacking thus far. Little may be anticipated from an

attempt to influence the mineral metabolism. Calcium administration in any form is useless. Structural defects from tissue loss are independent of callus deficiency. Despite local osteogenesis, splinting support of parallel bones, or contact between bone fragments, bridging the gap is unsuccessful. Premature, radical removal of splintered fragments of a compound fracture, particularly a gunshot fracture, is a major cause of this type of pseudarthrosis.

The constitutional factor presents a real problem. Callus is not lacking; frequently, new bone production is abundant. The bone ends which produce abnormally dense roentgen shadows are hard as ivory, the callus grows in all directions, but not across the intermediate zone of cartilage and fibrous tissue or across the fine space which persists unchanged between the fracture ends. Without question, local conditions are important etiologically and mechanical irritation is a major cause of delayed union. If the sum of small, often-repeated mechanical stimuli in the presence of fatigue can lead to softening, osteoporosis and exhaustion-fractures, Looser's zone of reorganization and march fractures or infarctions, and to aseptic necrosis and Sudeck's atrophy, then the same disturbance may likewise cause a callus dyscrasia. Each attempt at healing is nipped in the bud, each new capillary loop is ruptured, and the gap remains unbridged. The danger is great if the fracture lies at a point of stress. Pauwels considers hemorrhage and marginal necrosis as important stimuli for healing, in excess, however, both may be injurious. The difference between benefit and injury is quantitative. Haase and Ulrich demonstrated that a measurable rise of temperature at the fracture site apparently is deleterious to the life of bone substances. Foreign bodies act as irritants, and screws, wires, nails, and bands may be quickly encapsulated. Since every metal, including rustless steel, is soluble, chemical and electrical irritation may develop coincidentally with the mechanical injury. Interposition of soft parts does not necessarily play an important rôle, but poor alignment or distraction after overly energetic extension are important factors.

When a suspicion of vitamin deficiency exists the administration of Vitamin C and raw foods is indicated. Otherwise, the treatment varies with the local requirements. Injections of substances locally are valueless. Attempts to activate the regenerative processes made latent by renewed pathological disorders are more effective. The drilling of the bone, the refracture of the pseudarthrosis, and the use of bone chips are promising methods. The transplantation of living tissue is an outstanding contribution. Periosteum and bone marrow have been tried, likewise spongiosa, and finally, the free transplant of periosteum-covered pieces of bone. The pseudarthrosis is resected circumferentially, the marrow cavity is opened wide to receive the tibial transplant, and then the bones are fixed to an onlay graft. The necessary wire sutures are so placed that they may be removed without a second operation. The

compared the force exerted by these fingers to the force necessary to provoke rupture of the sutured tendons. In no instance was the force of the fingers greater than the strength of the tendons sutured by the author's techniques and that of Lange. Other techniques did not meet with this standard.

The author found that the strength of the tendon sutures by his technique was greater than the force exerted by the comparable muscle. He divided the Achilles tendons of dogs and sutured them by his technique. In some cases tendon grafts were done. Immediate postoperative motion was instituted. In this way it was possible to avoid the formation of adhesions which cause resulting poor function. The final sections of the Achilles tendons showed perfect healing and the tendon sheaths were smooth and glistening. At the site of the sutures there was a small nodule.

HARVEY S. ALLEN, M.D.

Reekling, F. A Contribution to the Management of Injuries to the Elbow Joint (Beitrag zur Nachbehandlung von Ellenbogengelenksverletzungen). *Med. Welt* 1937 p. 477.

Injuries to the joints are always serious as the danger of stiffening is present. Especial care is necessary about the elbow because this joint combines the work of a hinge, ball and socket, and pivot joint. Three principles are considered in the management:

1. Special care must be taken of the injury.
2. The joint must be mobilized with notice of the complications liable to appear. The immobilization may last up to four weeks, although other authorities will shorten this time because of the outstanding danger of stiffening of the joint.
3. Motion must begin at the right time. By careful watching with the roentgen ray the appearance of beginning union may be noted in from ten days to as many weeks. This is the time to begin motion which must always stop short of the point of pain. Overpowering motion under narcosis may be disastrous through stimulation of the tissues lying about the joint and cause atrophy of the capsular ligament, contraction of the muscles, even myositis ossificans.

Detailed descriptions of 2 cases show the advantage of supervised active motion and the danger of premature energetic manipulation. If joint stiffening, capsule shrinking and contracture are caused by new bone formation then operative removal of the hindrance is necessary. The elbow must be carefully handled by bandaging it upon splints with the flexion of the joint growing greater with each bandaging. Improvement comes rapidly to a strong flexion deformity with the use of light work, however, each time a strange motion is attempted the muscle spasm will recur.

HAWTHORNE C. WALLACE, M.D.

Girard, V. C. Ankylosing Operations on the Spinal Column (Las intervenciones anquilosantes del raquis). *Rev. de ortop. y traumatol.* 1936 6: 119.

In bringing about ankylosis of the spinal column for the cure of disease the author used chiefly the

technique of Albee. Various other authors have made modifications of this method and diagrammatic illustrations of several methods are given. The principle of all of them is to insert a bone graft into a bed prepared for it by splitting the spinous processes of the diseased vertebra and one or two of those above and below it. The graft is held in place by suturing the muscles and aponeurosis over it. In cases of very great kyphosis Albee curves the graft by making small cross-cuts in it with the electric saw.

The author describes 36 cases which he has operated on in this way in the Orthopedic Section of the Italian Hospital in Buenos Aires. Thirteen of these were cases of lumbal Pott's disease, 17 thoracic Pott's disease and 1 each of spondylolysis, spondylolisthesis, fracture of a thoracic vertebra, Kummell-Verneuil's disease, scoliosis and severe vertebral arthritis. Eight of these patients are still under treatment and 1 died, therefore judgment can be passed on the effect of the treatment in 27 cases. Twenty six of the patients were discharged as cured. In 1 case of painful scoliosis in an adult ankylosis was not accomplished; the author thinks the poor result in this case was due to defective technique.

This operation is easily performed and free of danger. There is a very small operative mortality. For many years it was used only for tuberculosis of the spinal column. Later it was extended to scoliosis, spondylolisthesis, fractures and luxations of the vertebra, vertebral arthritis, tabetic arthropathy, painful sacralization of the fifth lumbar vertebra and infectious spondylitis.

These ankylosing operations do not take the place of orthopedic treatment in tuberculosis but supplement it by keeping the diseased focus at rest and allowing cure to take place. In scoliosis the operation should be preceded by orthopedic treatment so that the column may be fixed with the slightest possible degree of deformity.

AUDREY GOSS MORGAN, M.D.

Hackenbroch, M. Bone Plastic Surgery on the Malleoli. An Operative Procedure to Correct Defective Supination of the Dorsum of the Foot in Club Foot and Pes Cavus (Die Knochenplastik im operativen Verfahren zur Beseitigung fehlerhafter Supinationsstellung des Rückflusses beim Hohl und Klumpfuß). *Arch. f. orthop. Chir.* 1916 37: 138.

The bone plastic operation was suggested by Hackenbroch in 1920 to correct a residual supination of the dorsum of the foot in pes cavus. Later the procedure proved useful in old, incompletely corrected club foot. The procedure is frequently rejected although it is less serious than the commonly performed radical operations on the skeleton of the foot. It is used in faulty supination of the dorsum of the foot especially when the talus is involved. According to the investigations of Kruus and Dittrich the lower ends of the tibia and fibula in club-foot are excessively displaced outward or externally as a

If an anterior spike projects after healing, it is resected. If the carrying angle has been altered too severely, an osteotomy of the humerus is done to correct it.

After three weeks the sling is gradually lowered for gravity-extension and an active range of flexion is started and slowly increased. Active movements of the fingers and wrist are started immediately after the reduction.

The writer does not favor massage, assisted movements, horizontal bars, or carrying of weights.

The rare flexion type of supracondylar fracture requires modification of the above treatment, some cases are treated at a right angle and others in a Thomas arm splint in extension. Some adults are treated by passing a wire through the olecranon with screw traction with the forearm pronated and the application of an unpadded plaster cast.

West does not favor metal fixation for "T" or "Y" fractures into the elbow joint, stating that most of these attempts result in ankylosis. Wire traction through the olecranon is advocated.

Fractures of the external epicondyle are best treated by incision, reduction, and suture with two catgut stitches.

In fractures of the internal epicondyle open reduction is favored with transposition of the ulnar nerve.

Fractures of the head of the radius are treated by resection of the entire head, except in small chip fractures or crack fractures without displacement.

Fractures of the olecranon with slight separation are best treated in extension with an anterior plaster slab to maintain the position. With greater separation, open reduction and catgut or fascia suture are indicated. Wires, screws, and silkworm are condemned. The position of moderate flexion is advised. The parts are immobilized for about five weeks.

DANIEL H. LEVINTHAL, M.D.

Lichtenauer, F. A Contribution to the Management and Duration of Operative Treatment of Fractures below the Knee (*Ein Beitrag zur Behandlung und Heildauer blutig behandelte Unterschenkelbrüche*). *Beitr z klin Chir*, 1937, 165, 422.

In considering the management of shaft fractures the question of conservative or operative treatment is vigorously discussed. The rule of the Rostock clinic favors non-operative treatment and permits operation only after an unsuccessful attempt at reduction under anesthesia and when it is impossible for the fragments of the reduced fracture to unite in a good position.

Operation is permitted only in oblique and spiral fractures below the knee if the distal fragment is

displaced laterally and the proximal fragment is drawn forward and to the inside by the pull of the extensors of the thigh. Even with the strongest pull on the os calcis it is not always possible to produce an exact apposition, and a strong pull on the os calcis delays healing. Therefore, the care of these fractures is operative, provided the safety of the correct position is thereby truly obtained, and the time of bed rest is not unduly prolonged. Since the injured person may stand up with his leg in plaster as early as a day after operation the operative treatment is brought into line with the principle of Boehler. Patients with fractures below the knee should be placed on their feet as early as possible. Foreign bodies should be avoided and plates and screws used only in transverse fractures. Lane plates after the modification of Johannessen may be used in oblique breaks in the future. However, if the thickness of the cortex permits that one fragment be fastened directly over the other with one or two screws, a sufficient hold may be obtained. The foreign bodies should be removed if the patient complains of pain or if there is suppuration.

The average hospitalization period for the non-operative cases was forty-five days as against sixty days for the operative cases. Moreover, many of the cases treated non-operatively presented insignificant breaks which were dismissed in the first few days with a cast. If the cases with the worst breaks are considered there was no evidence against the operative treatment.

Of 26 breaks 9 were corrected conservatively, 7 operatively without the use of foreign bodies, and 10 with the use of screws. On the average the conservatively managed patients remained in the hospital sixty-six days, those reduced operatively seventy-eight days, and those in which screws were used one hundred and fifty-two days. Of the 9 treated conservatively 6 were completely recovered in eight months. In 2 others the fracture was not yet solid after four and six months respectively. Information on 1 case is lacking. Of the 10 in which screws were used, the condition in 9 is known. Four patients are again fully recovered, 3 of them are working after three and one-half months, the fourth was an unemployed woman. In 2 others the fracture is not yet solid after seven and nine months, respectively. One patient is about 70 per cent recovered from his disability after seventeen months, another, a woman, is not yet fully able to earn her living after one and one-half years. One very badly shattered fracture was operated upon and screws were used, but nine months later the leg had to be amputated, as the fracture had not united and suppuration occurred.

(BODE) HAWTHORNE C. WALLACE, M.D.

use of a local sliding graft is a good procedure and spares the healthy tibia from injury. Central pegging is not reliable. A long and carefully supervised immobilization is important.

JEROME G. FINDER, M.D.

Pfaff, B. The Experiences of the Accident Wards of the Hospitals of Graz (Service of Wittke) in the Development and Management of Pseudarthrosis from 1926 to 1935 (Die Erfahrungen des Grazer Unfallkrankenhauses (Vorstand Professor Dr. A. Wittke) in der Entstehung und Behandlung der Pseudarthrosen aus den Jahren 1926-1935) 61 *Tag d. deutsch. Ges. f. Chir. Berlin 1937*

The author reviews the material gathered from the hospitals of Graz over a period of a few years. This material embraces 108 cases of pseudarthrosis. There were 69 of their own cases after 736 fractures which they had treated from the first and 129 cases which had come from other institutions or physicians for treatment. The diagnosis of pseudarthrosis was made not merely on the basis of time, but only if the roentgenogram showed obliteration of the narrow cavity. Of these 108 cases of pseudarthrosis 181 were operated upon successfully in 157 and unsuccessfully in 24. There is a fixed tendency of pseudarthrosis to react to stress with rich callus production. In the consideration of their own cases it was definitely established that compound breaks were of no special significance since 9 of 10 of these proceeded to normal healing. Some injuries which through their severity were associated with extensive contusion of the soft parts and occasionally with skin necrosis were followed almost without exception by the development of pseudarthrosis. The constitutional habits of the patient play an important rôle. Obesity is especially unfavorable. Also persons of mixed races such as are found in eastern Germany are inclined to the development of pseudarthrosis. In their own cases and those received from other clinics purposeless handling was evident. Insufficient and too short fixation with inaccurate reposition of the fragments play a part in the development.

The operative treatment consisted of boring an opening through into the marrow cavity, cutting out all the morbid tissue approximating the freshened ends of the bone and encasing the limb in plaster for a long time. However, there was no particular rule in the application of the various operative procedures. A bone graft taken from the fractured extremity or from the sound tibia and fixed with a kangaroo tendon or wire was used frequently. There were no poor results with wire fixation even though the marrow cavity was bored into at the end of each fragment at the same time. Poor results followed the insertion of a tibial graft in the lower arm and leg. One case operated upon in this manner went on to healing; however, and a case of pseudarthrosis of the upper arm of seven years' duration was cured. A congenital pseudarthrosis which had been previously operated upon was treated in this manner but resorption of the graft occurred. A pseudarth-

rosis of the lower leg of nine years' duration healed with implantation of a part of the fibula. The plastic work on the skin and soft parts which is necessary before an operation may be done resulted in the healing of the pseudarthrosis in 3 cases. The reaming out of the marrow cavity was valuable in selected cases. Since this became common in 1931 the number of large bone grafts has substantially declined. However, this procedure is often not enough and is only auxiliary in many operations. The poor results of operations for pseudarthrosis are caused above all by infections which have gone on to extrusion of the graft. The treatment of pseudarthrosis requires not only the care of the surgeon but also unending patience on the part of the patient. Only by this cooperation can every pseudarthrosis be brought to healing. **HAWTHORNE C. WALLACE, M.D.**

West, E. F. Fractures in the Region of the Elbow Joint. *Med. J. Australia 1937 1 773*

The author reviews the anatomy, kinesiology, and mechanics of the elbow joint region and discusses those aspects of the normal joint.

Platt's analysis of 17 nerve lesions associated with fractures about the elbow showed 10 of the ulnar nerve, 4 of the median, 2 of the musculospiral, and 1 of the posterior interosseous. West states that in the majority of cases of nerve involvement recovery takes place spontaneously in from four to six months and that it is his practice to wait, except in severe median or musculospiral lesions without early signs of recovery and with the roentgen appearance of the fracture suggesting severe nerve damage. In the latter cases early exploration is advised.

The factors of circulation contributing to the production of Volkmann's ischemic contracture are discussed as well as the location and possibilities of injuries to the brachial artery and the profunda vein with hematoma beneath the tense brachial fascia.

Sir Robert Jones' full flexion method of treatment of all fractures about the elbow, excepting fractures of the olecranon, is recommended, but the author cautions against extremes of flexion in cases of impending ischemia with absence of the radial pulse or extreme tension in the antecubital fossa. The danger signals of great pain, swelling, cyanosis and lividity of the fingers and absence of the pulse call for lowering of the forearm, rest in bed with the limb on a pillow, and if no improvement results incision of the brachial fascia with evacuation of the clot.

The writer favors early reduction under general anesthesia and the cuff and collar to maintain flexion. A dorsal molded plaster is used. No circular constriction is permitted.

In those cases which do not permit immediate acute flexion that position is obtained gradually. Severe pain in the fingers may be the first warning of an impending ischemia.

Check up roentgenograms are necessary in both planes and the lateral as well as the posterior displacement of the distal fragment must be corrected.

chest, or destruction of the cisterna and interference with the drainage of the mesenteric lymphatics

In approaching the study of lymphatic drainage and in planning experiments for the elimination of this drainage, the principal objectives were to answer these queries (1) Is the integrity of the lymphatic system necessary to life? (2) What effect does elimination or blockage of the lymphatic system have on the supply of leucocytes to the circulating blood? (3) What effect does this blockage have on the nutrition of the animal and, in particular, on the absorption and utilization of fats?

The cellular picture of the blood was determined frequently in most of the experiments both before and at varying intervals after the operation. In many of the animals there was undoubtedly temporary obstruction, which was relieved by the opening of collateral lymph vessels. In these animals there was a marked temporary change in the blood picture with a return to normal. The essential alteration in the blood consisted of a marked decrease in the eosinophils and lymphocytes. In most of the animals in which evidence of blockage disappeared, lymphatic communications with the inferior vena cava were demonstrated at autopsy.

The findings of these authors indicate that complete lymphatic blockage was produced in three dogs. There was an almost complete disappearance of the lymphocytes and eosinophils from the blood stream. The animals lost weight rapidly and were killed when it was obvious that they were going to die. The lymphatics of the abdominal organs were markedly distended, and there was an extravasation of chyle into many of the tissues.

HERBERT F. THURSTON, M.D.

Polichetti, E: Neurological Lesions in Malignant Granuloma (Lesione nervose da granuloma maligno) *Clin. chir.*, 1937, 13: 381.

Polichetti discusses recent advances in the knowledge of malignant granuloma and especially its localization in the nervous system, with references to case reports and the possibilities of palliative op-

erations in such cases. He believes that there is an absolute increase in the frequency of the disease.

He gives a detailed critical report of a case in a woman twenty-seven years old who developed spastic paraplegia of the legs and flaccid paraplegia of the arms. The disease began four years before death with pruritus and neuralgic pains in the arms. Fifteen months later, enlarged supraclavicular glands and thoracic girdling pains appeared, and a few months afterward, pain in the right iliac fossa and hip developed, followed by ulnar paralysis, claw hand, fulminating crises of the radicular type, rigidity of the neck and trunk, pain in the legs, and very painful tonic-clonic spasms. There was no evidence of growths in the chest or spinal column. The symptoms were temporarily helped by radiotherapy, but spastic paraplegia of the legs and anesthesia to touch and pain to the level of the nipples developed. The diagnosis lay between funicular myelitis and extradural compression myelitis. The myelographic findings were contradictory, but the clinical picture seemed to favor the second diagnosis. An exploratory laminectomy of the first five dorsal vertebrae was undertaken for palliative purposes. The bone, spinal roots, meninges, and cord showed no gross lesions. If the patient's condition had been less precarious, a cordotomy or resection of the posterior roots would have been done. After a transient amelioration of the symptoms, a complete flaccid paralysis and anesthesia of the arms developed rapidly, and the patient died thirty-one days after operation. Autopsy was refused.

The final judgment on the case is that the cord lesions were of a toxic, infective nature, and that the toxin or virus was probably transmitted through the blood stream. The author queries whether there is a neurotropism of the hypothetical virus. In this case, the cord involvement was predominant, and with each fresh invasion of the glands there was an exacerbation of the neurological disturbances.

The article is accompanied by microphotographs, roentgenograms, and a bibliography.

M. E. MORSE, M.D.

SURGERY OF THE BLOOD AND LYMPH SYSTEMS

BLOOD VESSELS

McVeeley R W and Shapiro P F Arterial Repair by Muscle Transplants *Surgery* 1937 1 61

The authors briefly review the history of the surgical repair of injuries to large arteries and the treatment of aneurysms. In considering the most important sequelae to operations of this type it is noted that secondary hemorrhage carries a greater threat than gangrene with the latter a part or the most of a limb may be lost but with a secondary hemorrhage the patient is frequently lost.

In studies of methods designed to prevent secondary hemorrhage experiments were performed by the authors on dogs in which pedicled muscle grafts were implanted within arteries previously injured by one of various methods. In every instance the pedicled muscle graft when examined later was found to have remained viable and the transplanted portions were attached to the walls of the arteries. In no instance was there a recanalization of the artery such as had been observed by others when similar implants were made within the lumina of the veins.

Experimental attempts were made also to produce aneurysms within the walls of the arteries. Of these none were successful because of the rapid healing with dense fibrosis.

In two dogs longitudinal wounds were made in the carotid and femoral arteries. No sutures were used to unite the wound edges but pedicled muscle grafts were rolled around the arteries so that the arterial wound was covered by the muscle patch. When the results were studied in from two to five weeks every wound was well healed although no sutures were used. There was no immediate nor ultimate impairment of the arterial lumen.

Two cases were reported in which a free and a pedicled muscle transplant were used for hemostasis successfully. HERBERT F TWISTON, M.D.

Palma R Anatomical and Functional Results of Arterial Ligation with Bands of Aponeurosis (Conseguenze anatomiche e funzionali della legatura delle arterie con strisce aponeurotiche) *Riv di chir* 1937 3 267

The interest of the present observation lies in the opportunity to determine in man the changes in an artery ligated with a strip of aponeurosis. The patient who had a tumor of the anterior pillar of the fauces was in collapse from hemorrhage. The common carotid artery was ligated with a piece of the fascia lata fixed by catgut sutures and the constriction was just sufficient to obliterate the peripheral pulse. The blood pressure after operation averaged 105/55 and there were no cerebral symptoms. The patient died thirty-four days later from pulmonary metastases.

At autopsy the lumen at the site of ligation which was about 2.5 mm in diameter was occupied by an organizing clot which extended a short distance above and below. The part of the ligation in contact with the artery was hyaline and the external part was normal. The intima was intact and the muscular and elastic tissues showed only minimal lesions. Palma considers that none of the theories of the origin of neurological symptoms after ligation of the carotid are applicable to all cases. Perhaps the diversity of clinical evolution is not due to a difference in lesions. There may be only one type of lesion the degree of which determines whether it is reversible or not. If the amount of blood suddenly falls below the minimum for function of the centers the disturbances are immediate. If the amount is sufficient the disturbances may be explained by disequilibrium of the blood pressure which gradually produces stasis edema or hemorrhage.

As to the advantages of fascial bands the present case proved that they did not prevent thrombus formation. The slowness of injury to the vessel wall was due to the elasticity of the ligation and the moderate degree of constriction. The non coalescence of the walls was noteworthy. Simple reduction of the lumen was sufficient to control hemorrhage. Since the ligation was anchored by sutures the blood flow must have been abolished at first. Reestablishment of the lumen seemed to be due not so much to stretching of the aponeurosis as to a disproportion between its elasticity and the force of the blood stream. The thrombus formation which was caused by slowing of the current was secondary and did not detract from the value of the method for stopping hemorrhage. The later partial reestablishment of the lumen made the effect of the operation analogous to temporary ligation except that the vessel walls were practically uninjured. The method is therefore inadequate when permanent closure is desired. Whether the favorable postoperative course and the avoidance of injury to the vessel walls will justify the operation in order to avoid cerebral disturbances after ligation of the carotid only further experience can decide.

The article is accompanied by a colored plate photographs and references. M E MOSE, M.D.

LYMPH GLANDS AND LYMPHATIC VESSELS

Blalock A Robinson C S Cunningham R S and Gray M E Experimental Studies on Lymphatic Blockage *Arch Surg* 1937 34 1040

The authors performed experiments on 32 dogs and 22 cats in an effort to produce complete blockage of the lymphatic system. A total of 267 operations were performed. A variety of operative procedures were carried out but in general they consisted of blockage of the lymphatic ducts in the neck and

ness of the burn. It returned to normal rapidly in small burns. The hyperglycemia reached a maximum in from two to six hours and then gradually declined. In one dog it reached 2.12 grams.

There was a reduction of plasma protein which equaled the amount found in the burned area. There was progressive acidosis following a severe burn. There was progressive hypochloremia in plasma and cells and an increase in chlorides in the burned area. There was active proteolysis in the burned tissue which was reflected in a hyperazotemia, and an increase in polypeptides and total non-protein nitrogen. There was a concentration of blood cells followed later by a diminution of both red and white cells. There was also an increase in the sedimentation time of the blood.

In the treatment, blood studies were made immediately to determine the extent of hyperglycemia, hypochloremia, and hyperazotemia. A blood count and hemoglobin determination were made also. Treatment was started by an intravenous infusion of 50 c cm of 20 per cent saline solution and of from 75 c cm to 100 c cm of 30 per cent glucose solution. Thirty units of insulin in two injections of 15 units each were given sixty minutes apart. This was repeated in from eight to twelve hours later, and again in twenty-four hours.

An extensive bibliography follows the article.

STANLEY J. SEEGER, M.D.

Sirohi, M.: Report on My 29 Cases of Tetanus (Ein Bericht ueber meine 29 Tetanusfaelle) *Wien med Wchnschr*, 1937, 1: 207.

The region about Koprivnica in Croatia is "tetanophil" however, there are also "tetanophobe" regions in Croatia, as for instance Ogulin, where, in spite of the fact that serum prophylaxis is not practiced, not a single case of tetanus has occurred during the past ten years.

The author emphasizes the fact that in 27 cases the attack of tetanus followed a slight injury. Since the entire rural population goes barefoot, it was hard to say just when the infection took place. It usually occurs from grain stalks, but also from splinters of hemp, bits of glass, splinters of wood, and spicules from the bones of dead cattle. Twenty-seven of the author's cases were extremely severe, but of the entire 29 only 6 (20.68 per cent) terminated fatally. Of the 1,802 cases in the whole of Yugoslavia in the past five years, 50 per cent terminated fatally.

The author distinguishes (1) severe cases with generalized, unremitting, tonic body rigidity, (2) severe cases with dominant tonic-clonic cramps and jerking movements, and (3) extremely severe cases with an equally developed body rigidity and reflex irritability. The younger the patient, the more pronounced the opisthotonus with marked lordosis. There were 3 of these cases.

A case of "pleurotetanus" with marked lateral curvature and nystagmus which remained after the recovery of the patient was very interesting, after recurrence two months later and even after a second

recurrence after a like interval the nystagmus still remained. Another interesting case was that of outspoken cephalic tetanus and tetanus hydrophobicus with severe generalized tetanus which terminated fatally.

As to treatment, total dosages from 50,000 to 250,000 units of deproteinized Behring serum or Serum H F F were given intramuscularly, intravenously, and intraspinally, combined with narcosis. Either the Billroth mixture or ether was used, and preliminary to beginning the use of the narcosis from 15,000 to 20,000 units of antitoxin were given intramuscularly. During the narcosis a like amount was given intraspinally and toward the end of the narcosis, a like amount intravenously. In addition the author gave by turns magnesium sulphate (25 per cent) intramuscularly, chloral hydrate by clysis, and luminal-sodium intramuscularly. Recourse was also made at times to pernocton, somnifen, and morphine. Curare and avertin were not used. Anaphylactic shock was not seen in a single case, in one case, following intravenous reinjection, a marked urticaria, which was easily conquered with injections of adrenalin and calcium Sandoz, was observed. The author, however, frequently resorted to desensibilization by injecting 1 c cm intramuscularly from three to four hours before the principal injection.

(FRANZ) JOHN W. BRENNAN, M.D.

ANESTHESIA

Kraas, E.: Peridural Anesthesia (Penduralanästhesie) *61 Tag d. deutsch. Ges. f. Chir.*, Berlin, 1937.

Peridural anesthesia offers the advantages of a controllable regional spinal anesthesia without affecting the cerebrospinal fluid. Doghotti deserves the credit for having, in part, discovered the anatomical basis of peridural anesthesia and for having developed its practical application. Up until the present no notice was given to the peridural space by the anatomist. The peridural space is a closed space extending from the sacral region to the base of the skull, which contains loose fatty tissue with numerous veins of varying caliber, the nerve roots, and the spinal ganglia. On the basis of the author's own histological research it was determined that the nerve roots received no connective tissue covering of any kind from the dura mater, so that anesthetic fluid injected into the peridural space is able to take effect directly upon the nerve roots in the particular segment.

The difficulty in effecting peridural anesthesia lies in the finding of the peridural space, which is only a small cleft. The injection technique itself is described accurately in its various details. The author rejects the use of mechanical help for determining the position of the cannula, with sufficient experience it can be accurately determined when the point of the cannula enters the peridural space. A 2.1000 pantocain solution with the addition of 5 drops of adrenalin is used as the anesthetic fluid. The choice of the point of injection depends upon

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE, POSTOPERATIVE TREATMENT

Davis J S Is Adequate Masking Essential for the Patient's Protection *Ann Surg* 1937 105, 990

Davis again urges proper masking of the operating teams. Modern methods of sterilization of instruments and operating material, and proper scrubbing technique leave only two remaining routes of wound infection. These sources can come only from improper masking of the nose and mouth or directly from the bacteria in the air. Meleney is quoted as having traced specific organisms isolated from wound infection directly to the operator or a member of the operating team whose nose was not masked. From 3 to 23 more bacterial colonies can be grown on Petri dishes if the team wears only mouth masks. In 111 normal individuals culture of the nasal mucosa yielded the following organisms: *staphylococcus albus*, *staphylococcus aureus*, *staphylococcus citreus*, *bacillus coli*, *salmonella*, *Friedlander's bacillus*, *pneumococcus*, *bacillus ozenae* and molds and yeasts. When infection is present additional organisms such as hemolytic streptococci and staphylococci and the influenza bacillus may be recovered. Meleney found 33 per cent of individuals in good health to harbor the hemolytic streptococci in the throat and nose.

The ideal mask should prevent the passage of bacteria through its material when the nose and mouth are covered. It should be comfortable and of simple but effective construction. It should be economical and easily sterilizable. The author uses two masks made of three or four thicknesses of woven muslin with 60 strand to the square inch. The first mask covers the mouth. The second mask also covers the mouth and in addition covers the nose. Each mask has four tapes for tying to the head.

The author believes that the possibility of air borne infection is not to be disregarded. In an operating room through which people are constantly circulating bacterial cultures yield more colonies than one which is quiet. Electric fans should not be used in the operating room because they stir up particles of dust and thereby increase the possibility of wound infection.

Penfield's operating room contains certain safeguards against air borne infection. All the air entering the room is washed with water and oil. All permanent fixtures are covered with a solution of 50 per cent glycerine and water to catch any dust particles that may settle. Hart has been using a form of radiant energy which will kill at a distance of five feet a heavily sprayed culture of bacteria within one minute. The author believes that if this radiant energy can be proved to be non injurious to tissues and to the operating room personnel it may be a desirable asset to the operating technique. However,

less it will not eliminate adequate masking for no rays are efficient to destroy quickly enough the bacteria discharged from the nose.

The author advises that anyone with an upper respiratory infection should be kept out of the operating room. All carriers of streptococci should be treated until they are no longer carriers. Precautions should be made for observers so that they are completely removed from the operating scene by a glass wall or other device. The use of cloth boots to be drawn over the shoes is recommended so as to further eliminate all dust particles by that route.

Benjamin C. F. Swannarmer M.D.

Matiniak J W Repair of Facial Defects with Special Reference to the Source of Skin Grafts *Arch Surg* 1937 34, 807

Facial defects requiring skin grafting should be covered if possible with skin that harmonizes in color and texture with the surrounding area. This may require an additional or more difficult operation than would be required on an unexposed part of the body. A skin flap from the forehead is the best in the absence of surrounding skin. For a defect on the cheek the combined use of serial excision and a flap from the forehead minimizes secondary scarring and secondary grafting on the forehead. The flap from the forehead is particularly recommended for the restoration of nasal loss.

A tubed pedicle flap from the neck is valuable for reconstruction of the lower half of the facial contour. A large surface on the neck is best covered by a delayed tube pedicle or migrating flap from the lateral aspect of the chest and abdomen.

Maxwell L. Liechtenstein M.D.

ANTISEPTIC SURGERY TREATMENT OF WOUNDS AND INFECTIONS

Lambert O and Drissen J The Humoral Tissue Syndrome in Extensive Burns Pathogenesis Treatment (Le syndrome humoral-tissulaire des brûlures étendues. L'étiologie Traitement) *Rev de chir Par* 1937 56, 319

It was shown that in an experimental hot water burn on a dog there was a hypertension of from 60 to 25 mm of mercury lasting about two hours. This was followed by a period of hypotension. This period of hypertension was accompanied by hyperglycemia and probably by suprarenal stimulation. The period of hypotension was progressive just as in severe traumatic shock and was due to extravasation of plasma into the tissues. The concentration of the blood was determined by the injection of Congo-red. The concentration reached its maximum in about one hour and then decreased but was still increased over normal after six hours. The concentration of the blood was proportional to the seriousness

There is no antagonism between the apyretic effect of 928-F and the barbituric acids. The fever does not check the convulsions. If the barbituric sleep is not very deep, 928-F will shorten its duration. If the barbituric dose reaches the limits of toxicity, 928-F will insure survival of the animal without interrupting sleep.

A little before the convulsions due to 928-F become manifest certain of the conditioned reflexes disappear. The barbituric acid will also insure intact preservation of these reflexes by preventing convulsions. The sulphureted derivative corresponding to this amine, 1259-F (or phenylic ether of diethyl-amino-ethanethiol), possesses properties similar in all details to those of 928-F.

EDITH SCHANCHE MOORE

SURGICAL INSTRUMENTS AND APPARATUS

Johnson, H. L.: Insulating Patches and Absorbable Sutures Made from Fetal Membranes. *New England J. Med.*, 1937, 216: 978

Because of wound disruption and adhesions forming postoperatively in serous cavities and after repair of nerves and tendons, there is a demand for an improved absorbable suture and insulating patch. The author believes that fetal membranes properly prepared will greatly alleviate most of the difficulties.

The preliminary report concerns the availability and use of fetal membranes for use as absorbable insulating patches and suture material. The source of the products is from human amniotic membrane and bovine amniotic and allantoic membranes.

The first concern was the reaction of the tissues to the product, and this was tested by comparing the reaction about the fetal membranes to other commonly used materials.

Allantoic membrane as compared to equal sized ribbon catgut produces early, in one week, a greater reaction, but later, in three weeks, its reaction decreases and the membrane is preserved while the catgut is nearly absorbed.

The next observation was on the intraperitoneal use of a sterile insulating patch of allantoic membrane for the purpose of protecting a traumatized area of parietal peritoneum from adhesions to the surrounding structures. In each instance the protected area prevented the formation of adhesions as compared to controls. Microscopically, this area after trauma became covered with mesothelial cells.

These intraperitoneal patch experiments were repeated to compare the bovine allantoic membrane in different animals to such products as cargin membrane, ribbon catgut, human amniotic membrane, and cellophane. Grossly and microscopically, the human amniotic and bovine allantoic membranes gave similar results. Ribbon catgut most nearly simulated the gross effect of the fetal membranes. Cargin membrane and cellophane produced very extensive adhesions.

To determine the protective effect of the fetal membranes about tendons, operations were performed on the extensor tendons of calves. The tendons and sheaths were lacerated and repaired with allantoic-membrane sutures or catgut plus insulating patches. The controls in the same animals were repaired without the insulating patches of fetal membrane. The control showed poor function and adherence to the surrounding tissue and skin. The use of the fetal membrane patch about the tendon and sheath at the end of four weeks showed a thickened but nevertheless adequately functioning sheath. The use of an excessive amount of fetal membrane patch did not markedly alter the result.

The preparation of the absorbable sutures is not unlike that of catgut except that the twisting was done by hand under moderate tension. The sutures are grossly similar to catgut and on a roughly estimated manual test showed remarkable tensile strength depending on the number of strands, the quality of the membrane, the tightness of the twist, and atmospheric conditions under which it was dried.

Detailed results will be given in a later communication.

HARVEY S. ALLEN, M.D.

the region of the operation for operations on the lower limbs and the pelvis the injection is made between the first and third lumbar vertebrae for operative procedures in the lower abdomen between the tenth and twelfth thoracic vertebrae and for operations in the upper abdomen between the eighth and tenth thoracic vertebrae. The amount of the anesthetic fluid to be injected depends upon the nature of the operation. Forty cubic centimeters are injected for operations on the upper abdomen and for the anesthetization of the entire abdominal cavity as for example in intestinal obstruction, but for procedures in the pelvis or on the perineum as for example prostatectomy, 30 c cm are injected. An appropriate individualization of the dose becomes possible as more experience with this method is gained. An important advantage of peridural anesthesia as compared with spinal anesthesia lies in its good compatibility. On the average the depression of the blood pressure is from 10 to 20 mm. of mercury, a decrease of more than 30 mm. has not been observed. The general condition and the nature of the pulse shows no undue changes after anesthesia is established as only a girdle like region of the vascular system is paralyzed. The extent of the anesthesia on the average covers from eight to ten segments. Disturbances of the respiration or collapse have not been observed by the author. After effects such as headache and vomiting, were seen only in their milder forms and only in a very few cases. The advantages that this anesthesia offers are surprising and justify its emphatic recommendation in those cases in which inhalation anesthesia or local anesthesia are not indicated. Peridural anesthesia used with the proper technique has shown itself to be dependable in all procedures on the abdominal cavity, the retroperitoneal space, the perineum and the lower extremities.

In the discussion KIRSCHNER stated that he had employed peridural anesthesia a great many times. Its dangers lie in the unintentional puncturing of the dura so that the large amount of anesthetic reaches the cerebrospinal fluid and possibly can cause fatal accidents. It was attempted to make the puncturing of the dura more difficult by using a needle with a rounded end and the opening on the side.

PHILLIPPIES has found that with the opening of the needle lying outside of the dural sac a manometer connected into the system will give no impulse on coughing whereas a coughing impulse occurs if the opening of the needle lies within the dural sac. However even these auxiliary measures are no guarantee against the puncturing of the dura and the dangers connected therewith. On the other hand the anxiety not to puncture the dura easily leads to the introduction of the needle to an insufficient depth the result of which is failure to obtain anesthesia.

As regional spinal anesthesia is not combined with dangers and disadvantages of this nature and moreover as it has the same advantage of anesthetizing

only a few nerve segments it appears to be superior to peridural anesthesia.

HARRY A. SALZMAN, M.D.

Stradlin, J. Analgetic Action of Diethylamino 1 Phenoxy 2 Ethane and Antagonism to Barbituric Acids (L'action analgésique du diéthylamino 1 phénoxy 2 éthane et antagonisme avec les acides barbituriques). *Invest. et anal.* 1937 3 315

In recent years much interest has been aroused from two points of view, in the antagonism exhibited between hypnotics and analgetics. The analgetics by their exciting effect upon the respiratory centers provide an efficient means of combating or preventing the toxic effects of the narcotics both in surgical cases and in cases of ordinary poisoning. The antitoxic effect is reciprocal: the narcotics in their turn combat poisoning produced by analgetics. Further more as all analgetics are simultaneously convulsive poisons the antagonism of the narcotics to these substances manifests itself by a more or less complete suppression of the convulsions induced by the introduction of analgetics into the body.

From these findings a criterion for judging the efficacy of the narcotic studied with regard to prevention and treatment of convulsive states in particular epilepsy may be obtained.

The convulsions which have been most thoroughly studied are strychnine, picrotoxin, thujon, camphor, and coriamin and cardiazol of the synthetic substances. The animals used in the present experiments were cats, dogs, rabbits, and rats.

Diethylamino 1 phenoxy 2 ethane or 928 F produces a very special type of epileptiform convulsions in the guinea pig characterized chiefly by movements of the jaw shaking of the head and clonic and tonic spasms of the muscles of the neck. Attempts to produce this effect in other rodents or in rabbits failed. Thujon produces somewhat similar convulsions but the animals are exhausted by them and die a few days later. The convulsive effect of cardiazol is more like that of 928 F. Twenty milligrams of cardiazol will not produce convulsions in the guinea pig, 30 mg. will do so in most cases but not constantly.

The special advantage of 928 F is that it produces convulsions of a very special type and because of its relatively slight toxicity can be administered to the animal daily over a long period. Therefore the attacks can be produced daily without harm to the animal and they last only a few seconds after which the animal is completely restored.

The analgetics tested included gardenal, narcosol, evipan, and 1287 F, ethyl 5 ethyl butyl 5 thio barbituric acid. All of these substances inhibit the convulsive action of 928 F. Guinea pigs were chosen for testing the analgetics. They were given injections of from 35 to 40 mg. of 928 F for several days. The animals weighed from 400 to 500 gm. and the white guinea pigs seemed particularly sensitive. When the animal responded regularly to the injection with typical attacks the analgetic was tested.

kilovolts peak, 15 ma, 0.5 mm of copper plus 1 mm. of aluminum and 50 cm distance. Two hundred roentgens, measured in air, are given every other day for three days, and 600 roentgens constitute a series. The basal metabolism rate is taken in one month and further treatment depends upon the results obtained.

In cases of hypertension associated with hyperthyroidism, an additional field over the dorsal and lower cervical sympathetics is included by the irradiation. The postoperative cases which do not respond to a moderate amount of irradiation are given treatment over the pituitary gland in an effort to diminish the amount of thyrotropic pituitary hormone.

It has been observed that the patient whose major symptom is nervousness, who has a small soft goiter, and who has been ill six months or less has the best prognosis for relief by irradiation. Irradiation treatment extends over some little time, and there is always the possibility that serious visceral changes will take place before the beneficial results become manifest. The size of the goiter is influenced little, if any, by irradiation. There is a possibility of depressing the thyroid activity until myxedema develops, but this condition occurs very infrequently. A temporary exacerbation of the symptoms of thyrotoxicosis may be expected for from twenty-four to seventy-two hours after the first few treatments. In the occasional patient there is a slight to mild skin reaction in the area treated. This is never more than a first-degree reaction which disappears in a short time.

The authors conclude from this study that with the present selection of cases, excellent results are obtained, as shown by the improvement which oc-

curred in 90 per cent of the cases treated during the years 1932 and 1933. HAROLD OCHSNER, M.D.

RADIUM

Howes, W. E.: The Use of 200 to 600 Millicurie Radon Pack in the Treatment of Malignant Lesions. *Am J Roentgenol*, 1937, 37: 668

The use of radium packs containing from 1 to 5 gm of radium element is of necessity confined to a very few radium centers, and because of the great cost of these packs, their economic use is questioned, especially with the present development of highly filtered roentgen rays, the depth dose of which is greater than that delivered by the larger radium pack in many instances.

In this article, the author recommends the more extensive use of small radon packs, from 200 to 600 mc., for the palliation of advanced malignancies and their metastases somewhere near the surface of the body. These packs are of value particularly in association with roentgen therapy as, according to the work of Quimby and Pack, tissues which have received the maximum of roentgen radiation which they will tolerate, will stand further treatment with gamma rays, and vice versa.

The arrangement for a typical 200-mc pack and its dosage is presented in the text. The cases treated included carcinoma of the esophagus, skin, mouth, and breast, sarcoma of bone, multiple myeloma, and neurofibrosarcoma. Eleven of the cases are briefly reported, and some illustrated with photographs before and after treatment.

In conclusion, the radiologist is cautioned against overdosage to the skin. T LEUCCTIA, M.D.

PHYSICOCHEMICAL METHODS IN SURGERY

ROENTGENOLOGY

Alexander F. K. The Roentgen Diagnosis of Intra Abdominal Hernia. *Am J Roentgenol* 1933, 38 92

A short historical review and discussion of the pathogenesis of the condition as given by various observers serves as an introduction to the subject. As regards terminology the author prefers the term intra abdominal hernia to that of duodenal hernia, right and left paraduodenal hernia, hernia into the descending mesocolon, hernia into the ascending mesocolon or mesentericoparietal hernia, which terms have been variously used by others in describing the same condition. It seems preferable to him because of its simplicity and the fact that it conforms to the roentgenological diagnosis. The anatomical and pathological significance attached to it appears to be often not familiar with the findings which is not true of the other terms.

Although the condition is uncommon it is not as rare as might be deduced from the comparatively few cases reported in the literature. It is probably being overlooked repeatedly during routine gastric intestinal roentgen studies because the progress of the opaque meal through the small intestine is not observed as carefully and as long as it should be and the observer is often not familiar with the roentgen appearance of the normal small intestinal pattern.

The clinical diagnosis is very difficult to make because there are no characteristic symptoms which definitely suggest the condition. A study of the cases observed by the author have impressed him with the fact that the condition should be suspected and looked for when the following facts which do not fit any particular syndrome are elicited in the history: abdominal pain which is exaggerated by exertion, by the erect position, or by eating; and abdominal pain which is relieved by reclining, or the recumbent position, and which is exaggerated by eating is relieved by smaller but more frequent meals, or by food containing a small percentage of roughage.

The roentgen diagnosis of intra abdominal hernia is made primarily by roentgenoscopic observations at short intervals of the barium meal as it passes through the small intestine. The small intestine may occupy the right side, midportion, or left side of the abdomen. The coils of intestine are grouped very closely. There may be considerable churning, regression and even distension of the small intestine with the presence of fluid levels and demonstration of the entrance of the small intestine into the hernia may be possible. The loops of bowel present an appearance and configuration as though they are contained in a sac or confined boundary rather than allowed the freedom of the abdomen justified by the length of the small intestinal mesentery. There is little movement on manual palpation and a

change in position or posture of the patient produces little if any change in the relation of the small intestine to the abdominal cavity. Manual pressure on one area of the mass of gut is transmitted throughout the mass. The distal ileum has been found free of the sac in the author's experience and its entrance into the cecum could be demonstrated. Although variation in the anatomical course of the duodenum and duodenojejunal junction is a frequent accompaniment of the condition it is not necessarily an indication of it.

Relative to the differential diagnosis postoperative adhesions, peritonitis, intestinal non rotation and a congenitally short mesentery must be given consideration. History together with the findings usually serve to differentiate the conditions except the last, which may simulate a centrally placed hernia.

Five cases are reported in detail from the clinical and roentgenological aspects, with roentgenograms illustrating the condition. *Am J Roentgenol* 1933, 38 115

Harris J. H. The Radiation Treatment of Hyperthyroidism. *Am J Roentgenol* 1933, 38 119

The authors review the physiology and pathology of the thyroid gland and discuss the clinical aspects of the classification of diseases of the thyroid gland. They review treatments of hyperthyroidism now in use. The results of surgical and irradiation treatment are compared. It is noted that there is little difference between the end results obtained by the two methods. Statistical studies in the two series are comparable.

Walters, Anson and Ivy found that the normal thyroid of the dog was not materially changed by roentgen ray dosage known to be of clinical value in 80 per cent of the cases of hyperthyroidism. The capsule of the thyroid was thickened only by an overdose which produced a skin ulcer. Friedman and Blumgart irradiated two patients by the Coulter technique; they gave 4,000 roentgens without back scattering with high voltage and heavy filtration. This amount of radium had no effect on the basal metabolism rate. Three months later total ablation was done and the pathological report showed normal thyroid tissue.

One of two general plans is followed. Most frequently the patient is given three series of treatments at intervals of three weeks following which the basal metabolism rate and the thyroid gland are examined by the thyroid clinic. The roentgen ray factors are 135 kilovolts peak, 5 ma., 0.25 mm. of copper plus 1 mm. of aluminum filtration, 30 cm. distance and a dose of 400 roentgens measured in air at one time through a portal 12 by 15 cm. with inclusion of the anterior thyroid area and the cervical sympathetics and protection of the larynx from direct irradiation. The second technique used at times employs 165

strains may be noted for months. If the estrin is continued the high tumor strains gradually develop a more intense and extensive growth.

Certain obstacles to growth are presented, such as the hyalin tissue which retards the rate and extent of collapse of fat in a malnourished mouse which does not support tumor growth well. Estrogenic hormones lead to the formation of new tissue because they stimulate the gland, and because stimulation causes carcinomatous formation. Precancerous and early cancerous stages have been observed in the vagina and cervix of mice in which estrin injection was continued for a considerable period. These changes have not been observed in the corpus of the uterus. The authors have not found the reported pituitary tumor in all high incidence strains, but have noted an increased incidence of mammary carcinoma associated with an increase in activity of certain cells in the anterior pituitary lobe. The injection of extract of the anterior pituitary lobe or of corpus luteum does not increase the incidence of carcinoma. In a large number of mice which were given injections, six developed a sarcoma, five at the site of the injections.

It then appears probable that specific growth stimuli ultimately change the cell equilibrium in such a way that certain substances which induce cell proliferation are propagated in an autocatalytic manner. As far as is known at present all the causes of carcinoma directly or indirectly stimulate growth processes. The cancerogenic hydrocarbons differ from other agents merely in a quantitative manner, but not as regards the principle underlying all these actions. Extrinsic viruses, such as those of Rous and Lucke, may function as specific growth stimuli, or they may remain associated with cells perpetuating the change. Rous believes a virus is responsible for all carcinomas and that stimulating hormones and hereditary conditions serve only to prepare the field in which the virus may become potent.

THOMAS C. DOUGLASS, M.D.

Bonne, C. Cancer and Human Races. *Am J Cancer*, 1937, 30: 435.

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As a basis for a report on the frequency of the various forms of internal disease, including cancer, hospitals with regular autopsy services are essential, but the figures from these hospitals must be interpreted with caution. They are useful, however, especially as they indicate peculiarities of the site incidence of cancer throughout the body.

There is a remarkably high frequency of primary liver carcinoma developing in cirrhotic livers, and in livers without vermiform infections, in various parts of the tropics, especially in the Far East. There is

a nearly total absence of gastric cancer among the native Malay population of Java associated with a similar scarcity of gastric ulcer, although the Chinese in Java and in the tropical parts of the Far East have in general the usual amount of gastric carcinoma and gastric ulcer. There is a peculiar frequency of primary malignant cervical lymph-node tumors of reticulo-endothelial origin in Java, Sumatra, Singapore, the Philippine Islands, Indo-China, and other parts of the Far East. Cancer of the skin of the legs, developing on old neglected ulcers of various nature, is of frequent occurrence among male Malays. Whether these peculiarities are due to inborn racial influences or to the special conditions of life of the Far East remains to be studied.

Figures are available for the total mortality from cancer in certain parts of Sumatra, where the Chinese and Malay population of the tobacco and rubber estates is registered, and hospital service and medical attendance are of a high standard. When the cancer rate here is calculated for a population of standard age, the total mortality is in accord with the usual figures for Western countries.

JOSEPH K. NARAT, M.D.

Klein, S. A.: The Importance of Antitoxin in Surgery (L'importance de l'antitoxine en chirurgie). *Rev de chir*, Paris, 1937, 56: 237.

Klein states that antitoxin therapy is used in surgery mainly under two conditions: in the treatment of infected wounds and inflammatory processes of the skin and mucous membranes, and in laparotomies to prevent and combat infection following soiling of the abdominal cavity or walls. He followed the general plan of Besredka in his studies, using Besredka's method of antitoxin preparation, but he did not concern himself, as did his predecessor, with such non-surgical entities as typhoid fever, dysentery, or anthrax.

In surgery one distinguishes (a) aseptic wounds; (b) septic wounds, both those contaminated but not yet infected and those with signs of active infection; and (c) inflammation. Using guinea pigs and rabbits, Klein tried the effect of antitoxins in all three conditions. In his study of the effect of antitoxin on clean wounds, the animals, guinea pigs, were prepared by percutaneous application or intracutaneous injection of antitoxin to produce immunization, and after twenty-four hours they were injected subcutaneously with a culture of homologous bacteria. Results were in agreement with those of Besredka; the antitoxin produced an immunizing effect as early as twenty-four hours and could be recommended for prophylaxis in supposedly aseptic wounds, such as surgical incisions, which however might possibly have become contaminated. In contaminated wounds experimentally produced in rabbits, the same general plan of treatment was used with the addition of the introduction of antitoxin directly into the wound. The wounds used were compound fractures, and the results of healing were so favor-

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Atkins H J B The Effect of Brachial Plexus Block on Patients Suffering from Secondary Traumatic Shock *Brit J Surg* 1937 24 717

Brachial plexus block was performed with the purpose of determining its effect upon the blood pressure in a series of patients with lesions of the upper limb. Patients suffering from varying degrees of shock due to lesions of the upper limb were selected. Blood pressure readings were taken during the course of the induction of anesthesia and the subsequent operation. The clinical condition of the patients served as a guide to the degree of shock. In shocked patients whether of the common hypotensive type or of the less common hypertensive type any agent which produces a sudden fall in the blood pressure serves to aggravate the shock and the patient's general condition deteriorates concomitantly with this fall in the blood pressure.

It was found that brachial plexus block exerts no protective influence upon patients suffering from shock due to trauma of the upper limb. Both brachial plexus block and local infiltration anesthesia tend to cause a fall in the blood pressure particularly in shocked patients. This fall in blood pressure is probably due to the local anesthetic irrespective of the site of introduction. It was found also that inhalation anesthesia is more suitable for shocked patients. **MANUEL F. LICHTENSTEIN, M.D.**

Mansfeld O A New Hemostatic Remedy (Beitrag zur Kenntnis eines neuen Blutstillungsmittels) *Mfogy. Vegygygy* 1936 5 17

On the basis of the animal experiments and clinical experiences that were made with pectin tetragalacturonic acid arabic ester which occurs frequently in the vegetable world and has accelerating blood coagulating properties which are striking, the Eri Laboratory at Budapest put on the market a preparation with a 1.5 per cent sterile isotonic solution in ampules for parenteral injection and also a 5 per cent stabilized solution and tablets with which the author carried out his experiments for the past year. An advantage of this preparation is the fact that the accelerating coagulating effect is not exerted directly on the blood but is brought about through the cooperation of the entire organism, namely in the sense of regulation of the physiological mechanism of coagulation. This fact assures this preparation the valuable property that even when large doses are given it does not produce coagulation within the circulation, namely thrombus formation.

The cases for treatment were carefully selected. Abortions and hemorrhages resulting therefrom were not included. Fibromyomas were also excluded. Only very severe hemorrhages lasting for weeks without

interruption were selected among these chiefly such hemorrhages as did not cease after prolonged rest in bed. Of a very abundant material only 22 cases came to observation; the patients were chiefly juveniles thirteen fifteen sixteen and seventeen years of age and in isolated cases they were in the preclimacteric stage. According to the author's experiences the preparation had its predominant effect in cases without anatomical findings also in vaginal patients with ovarian dysfunction but chiefly in cases of hemorrhage of inflammatory origin. Another use was for injection before operations on virgins for the purpose of avoiding an eventual parenchymatous hemorrhage. In plastic operations in total hysterectomies under local anesthesia in which the adrenalectomy solution was given intentionally without novocain this preparation was tried out; there were 15 cases altogether. An intragluteal injection was given from one to one and a half hours before the operation. The result was apparent. The rapidity of the coagulation was accelerated about 80 per cent. After an intramuscular or subcutaneous injection the zenith of the coagulating effect set in after an approximate latent period of one hour if given by mouth after about from two and a half to three hours and lasted in an unchanged strength for six hours.

(F. LICHTENSTEIN, M.D.)

Loeb L Burns E L Sontzoff J and Moskoff M Sex Hormones and Their Relation to Tumors *Am J Cancer* 1937 30 47

In a review of the experimental status of hormonal tumors the authors point out that an ovarian hormone has in the past been used for producing mammary cancers in mice. Murray has succeeded in producing a lesion in male mice by the transplantation of ovaries.

Besides estrin a second stimulating factor presumably a hormone intensifies the carcinomatous transformation and the incidence of carcinoma may be increased above the hereditary tendency characteristic of a certain strain (Lacassagne).

Recent studies have shown that tumors so produced are not complicated by accessory reactions as those produced by hydrocarbons and therefore may be more easily recognized. The development of hormonal carcinoma is the end stage of a continuous series of growth processes extending over long periods of time. From these observations the authors draw the conclusions that the carcinomatous change does not depend on a somatic mutation in the sense in which this term is used in genetics; that inflammatory changes are not an essential or necessary factor in the origin of carcinoma and that the essential factor is the action of the growth stimuli in cooperation with hereditary or other constitutional factors.

During the injection of estrin no difference in the growth of mammary tissue in the high or low tumor

strains may be noted for months. If the estrin is continued the high tumor strains gradually develop a more intense and extensive growth.

Certain obstacles to growth are presented, such as the hyalin tissue which retards the rate and extent of collapse of fat in a malnourished mouse which does not support tumor growth well. Estrogenic hormones lead to the formation of new tissue because they stimulate the gland, and because stimulation causes carcinomatous formation. Precancerous and early cancerous stages have been observed in the vagina and cervix of mice in which estrin injection was continued for a considerable period. These changes have not been observed in the corpus of the uterus. The authors have not found the reported pituitary tumor in all high incidence strains, but have noted an increased incidence of mammary carcinoma associated with an increase in activity of certain cells in the anterior pituitary lobe. The injection of extract of the anterior pituitary lobe or of corpus luteum does not increase the incidence of carcinoma. In a large number of mice which were given injections, six developed a sarcoma, five at the site of the injections.

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able that the author strongly favors the use of antitoxin in contaminated fracture wounds in which healing is often slow and complicated. He states that the apparent influence of the antitoxin is through its checking effect on bacterial growth. He was unable to draw any conclusions on older infected wounds in experimental animals as the same condition in man is not comparable to animals and therefore he believes that clinical observation alone must be used to determine the value of any of antitoxin therapy in infected wounds in man. The same conclusions were drawn from experiments with inflammatory lesions produced in the skin and mucous membranes of rabbits as artificially produced inflammatory lesions usually heal rapidly without treatment in rabbits if they are kept clean and dry.

In studying the effect of antitoxin therapy in such conditions as peritonitis induced appendicitis and perforation of the bowel the author found that the action of the antitoxin seemed less specific but more effective than filtered bouillon. There is difficulty in comparing animal with human pathology and for that reason the author is cautious in the interpretation of his results. The application of dressings saturated with antitoxin solution and the use of such a solution for irrigation have been tried by the author on such wounds as the abdominal incision following an operation for bowel resection or spontaneous perforation with peritoneal and parietal wall soiling the incision for strangulated hernia, the sacral opening for a rectal resection as in carcinoma of that organ and other operative wounds of a similar nature as well as on ulcers of various types, whitlows, furuncles, abscesses and erysipelas. The results have often been gratifying but they have not been consistent and the series studied was too small so that Klein is unwilling to offer antitoxin therapy as a very worthwhile adjunct to general surgery. He is reserved in all his conclusions and points out the necessity for more detailed experimental study and more clinical experience.

JORV MARTIN M D

DUCTLESS GLANDS

Koranyi A, Szenes T and Hatvany B E. A Hypotensive Hormone in the Parotid Glands of Animals (Sur une hormone hypotensive des glandes parotides animales). *Presse med* Par 1937 45 779

In 1909 Abelous and Bardier found a hypotensive substance in the urine of animals. Years later Frey Kraut and their collaborators found such a hypotensive substance in the pancreas which they called kallikrein. They found this hormone in the blood serum also but in an inactive form.

The authors have found a hypotensive substance which they have been able to identify as kallikrein in the saliva and in the parotid glands of human beings and animals. This substance was not found in any of the other salivary glands.

They describe their method of preparing and isolating the substance. One c.c. of saliva contains

an amount about equal to 16 units of the commercial product. Extracts of parotid gland in some cases had a strong hypotensive action and in some only a slight one. From these findings the authors conclude that sometimes the substance is present in the gland in an active form and sometimes in an inactive one. In the pancreas the hormone is always present in the active form.

This hormone has a strong hypotensive action. It keeps its effect even after a dialysis of forty-eight hours. For total inactivation it must be heated to a temperature of 37° C for two hours. The inactive form may be activated by a preparation of acetone. The hormone caused hypotension in dogs that had even been treated with atropine.

The administration of kallikrein in the usual dose of from 8 to 10 units by mouth has no effect at all. The usual daily secretion of saliva is 1000 c.c. which contains 1600 units of the substance. Eight or 10 units are therefore obviously ineffective and moreover experiments have shown that the hormone becomes inactive in the gastric juice.

ALFRED COSS MONROE M D

Albright F, Sulkowitch H W and Bloomberg E. Further Experience in the Diagnosis of Hyperparathyroidism Including a Discussion of Cases with a Minimal Degree of Hyperparathyroidism. *Am J Med Sci* 1937 193 800

This communication is based upon a study of thirty-five true cases of hyperparathyroidism which the authors have studied personally. They previously reported seventeen of these cases and the entire study represents a ten-year experience. This admittedly large series of cases is explained by the authors as being due to recognition rather than any regional peculiarity or to accumulation by reference from other sources. Of the thirty-five patients thirteen were sent to the clinic already suspected of having the disease and twenty-two were first examined at the clinic. All but two of the twenty-two patients had clinical findings entirely different from the cases reported in the literature from outside clinics. The authors divide twenty cases in which the clinical findings differ from those reported in the literature into two groups: (1) twelve cases with no demonstrable bone disease; (2) eight cases with a very moderate degree of hyperparathyroidism. As regards the first group the authors are of the opinion that the parathyroid hormone did not have a direct action on the bone tissue but rather on the phosphorus and calcium equilibria in the body fluids. In the hyperparathyroid state the disturbed equilibria resulted in increased losses of phosphorus and calcium in the urine. The authors refer to the second group of cases with the minimal degree of hyperparathyroidism as "borderline." However they emphasize the fact that the patients had a sufficient degree of hyperparathyroidism to be definitely disabled. Whereas the serum calcium level may not have been sufficiently high strongly to suggest the disease there were other factors which indicated the correct

diagnosis According to the authors, these factors may be any one or a combination of the following: (1) a persistently low serum phosphorus level; (2) an increase in the calcium excretion of the urine; (3) the presence of a large amount of calcium phosphate in a case of nephrolithiasis in which there are no other obvious causes for stones, such as infection or obstruction The authors emphasize two other features in making the diagnosis in these "borderline" cases The first is that repeated blood determinations should be made, because the values fluctuate from the normal range to the definitely hyperparathyroid range The second feature concerns the necessity of making serum-protein determinations, in order to determine more correctly the total calcium value, by making an allowance for the "bound" calcium The authors further call attention to the fact that the degree of hyperparathyroidism is not necessarily commensurable with the degree of bone disease, because patients with bone disease who have high serum phosphatase levels generally develop postoperative hypocalcemia Their tumors should be resected rather than entirely removed at the first operation

ALTON OCHSNER, M.D.

Gordon-Taylor, G., and Handley, R. S. An Unusual Case of Hyperparathyroidism. *Brit J Surg*, 1937, 25 6

The authors explain aberrant positions of parathyroid tumors on the basis of embryology Opera-

tive cases have been collected from the literature wherein the parathyroid tumor has been located within the chest Eleven reported cases of intrathoracic parathyroid tumors are discussed.

The authors present a case which gave all the signs, symptoms, and laboratory findings indicative of a parathyroid tumor Clinically there were osteoporosis, tumors and cysts of the bones, fractures, and high blood calcium At the first operation no parathyroid tumor could be found in the neck. At the second operation the sternum was split down its center for a short distance A $1\frac{1}{2}$ by $\frac{1}{2}$ by $\frac{1}{2}$ in. tumor was found in the anterior mediastinum, which microscopically resembled normal parathyroid tissue, with marked hyperplastic areas After operation the blood calcium dropped, and roentgenologically the bones showed greater density than prior to operation

Embryologically, the thoracic position of parathyroid tissue is not impossible. The descent of this tissue is explained in full in the text

The authors emphasize the fact that when positive, indisputable laboratory and clinical data indicating the presence of a parathyroid tumor are collected and the tumor cannot be located upon exploration of the neck, it will most likely be found in the thorax The successful treatment of parathyroid tumors in the past promises successful removal of this type of tumor in the future

RICHARD J. BENNETT, JR., M.D.

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Embolism of the inferior retinal artery J SVERDLICK and J AROUCH *Semana méd*, 1937, 44 171

Retinal tumors in tuberosus sclerosis review of the literature and report of a case, with special attention to microscopic structure H C MESSINGER and B E CLARKE *Arch Otolaryngol*, 1937, 18 1

The jaw-winking phenomenon report of a case E L COOPER *Arch Ophth*, 1937, 18 198

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Surgical and orthoptic treatment of concomitant convergent strabismus R K DAILY. *Texas State J M*, 1937, 33 320

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Ear

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